IX. APPENDIX TABLE OF CONTENTS

The Appendix must include a complete Table of Contents, which includes the page number or attachment number, attachment title, and relevant selection criterion. A sample table of contents form is included below. Each attachment in the Appendix must be described in the narrative text of the relevant selection criterion, with a rationale for how its inclusion supports the narrative and the location of the attachment in the Appendix.

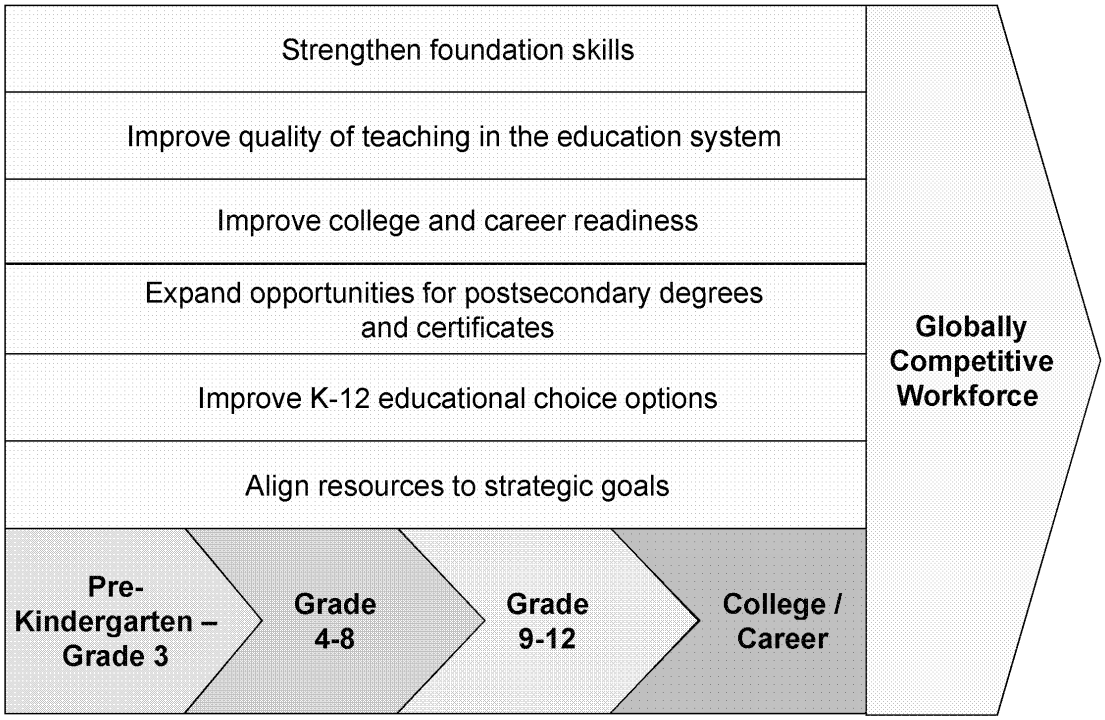
Appendix Title	Appendix #	Relevant Selection Criterion	Appendix Page #
Section A			
2009-10 Strategic Plan	A-1	(A)(1)	Appendix Page 1
Florida's Race to the Top Timeline	A-2	(A)(1)	Appendix Page 18
MOU for Participating LEAs	A-3	(A)(1)	Appendix Page 19
NAEP Goals Subgroup Detail	A-4	(A)(1)	Appendix Page 34
FCAT Goals Subgroup Detail	A-5	(A)(1)	Appendix Page 37
High School Graduation and College Readiness Goals Subgroup Detai	A-6	(A)(1)	Appendix Page 38
Support for Participating LEAs	A-7	(A)(2)	Appendix Page 40
Summary Statements of Support	A-8	(A)(2)	Appendix Page 46
Florida School Choice Options	A-9	(A)(3)	Appendix Page 55
NAEP Historic Subgroup Detail	A-10	(A)(3)	Appendix Page 75
FCAT Historic Subgroup Detail	A-11	(A)(3)	Appendix Page 79
State Assessment of SWD and ELL; Exception from NAEP	A-12	(A)(3)	Appendix Page 81
Section B			
Common Core State Standards Initiative Memorandum of Agreement	B-1	(B)(1)	Appendix Page 88
Common Core State Standards Initiative Press Release (list of states)	B-2	(B)(1)	Appendix Page 92
Documentation of Internationally Benchmarked Standards	B-3	(B)(1)	Appendix Page 94
Draft Common Core State Standards	B-4	(B)(1)	Appendix Page 96
Florida's standards adoption process and timeline	B-5	(B)(1)	Appendix Page 258
Assessment Consortium Memorandum of Agreement from each state	B-6	(B)(2)	Appendix Page 259
Assessment Consortium Foundational Agreements	B-7	(B)(2)	Appendix Page 283
Achieve, Inc. Agreement	B-8	(B)(2)	Appendix Page 289
Section (B) Initiative Summary Chart	B-9	(B)(3)	Appendix Page 292

Appendix Title	Appendix #	Relevant Selection Criterion	Appendix Page #
Section C			
America COMPETES Evidence	C-1	(C)(1)	Appendix Page 293
Florida's SLDS R4 Project Abstract	C-2	(C)(2)	Appendix Page 303
Timeline of SLDS federal grant activities	C-3	(C)(2)	Appendix Page 305
Section (C) Initiative Summary Chart	C-4	(C)(2)-(3)	Appendix Page 306
Section D			
List of institutions offering an EPI and/or Professional Training Option	D-1	(D)(1)	Appendix Page 307
Annual report, *Critical Teacher Shortage Areas 2010-2011*	D-2	(D)(1)	Appendix Page 320
2008-09 Learning Gains in Reading and Math	D-3	(D)(2)	Appendix Page 334
Rate of Teachers Exiting the System	D-4	(D)(2)	Appendix Page 336
Data on student performance of completers of Florida's teacher preparation programs (ranked)	D-5a	(D)(4)	Appendix Page 337
Data on student performance of completers of Florida's teacher preparation programs	D-5b	(D)(4)	Appendix Page 340
Section (D) Initiative Summary Chart	D-6	(D)(2)-(5)	Appendix Page 344
Section E			
Data on Historic Turnaround Record	E-1	(E)(1)	Appendix Page 348
2009-10 Differentiated Accountability School Categories	E-2	(E)(1)	Appendix Page 349
Lowest 5% of Title I-Eligible Schools	E-3	(E)(1)	Appendix Page 350
Lowest 5% of Title I Schools	E-4	(E)(1)	Appendix Page 351
Comparison of Turnaround Options and Florida Differentiated Accountability Requirements	E-5	(E)(1)	Appendix Page 354
Strategies and Support for Differentiated Accountability	E-6	(E)(1)	Appendix Page 362
Summary of DA School FCAT Performance Compared to the State	E-7	(E)(1)	Appendix Page 369
2008-2009 Progress in Targeted Schools	E-8	(E)(1)	Appendix Page 379
RTTT Persistently Lowest-Achieving Schools Timeline	E-9	(E)(2)	Appendix Page 382
Annual DA Regional Team Support Timeline	E-10	(E)(2)	Appendix Page 383
Regional Executive Director Job Description	E-11	(E)(2)	Appendix Page 384
District Turnaround for the Lowest-Achieving Schools Organizational Chart	E-12	(E)(2)	Appendix Page 387
Intervene and Correct II F High Schools to Receive CTE Expansion RTTT Funds	E-13	(E)(2)	Appendix Page 388
Model Full-Day Prekindergarten Programs	E-14	(E)(2)	Appendix Page 389
Section (E) Initiative Summary Chart	E-15	(E)(2)	Appendix Page 392

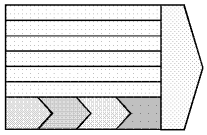
Appendix Title	Appendix #	Relevant Selection Criterion	Appendix Page #
Section F			
2008-09 State and Local FEFP Funds, Ranked and Unranked	F-1a	(F)(1)	Appendix Page 398
2008-09 State and Local FEFP Funds per student, Ranked and Unranked	F-1b	(F)(1)	Appendix Page 400
Florida's Profile in the CER report	F-2	(F)(2)	Appendix Page 402
America Journal of Education Article	F-3	(F)(2)	Appendix Page 404
Florida Charter School Application Evaluation Instrument	F-4	(F)(2)	Appendix Page 431
Charter School Closures	F-5	(F)(2)	Appendix Page 447
2008-2009 Charter School Student Achievement Report-Data	F-6	(F)(2)	Appendix Page 452
VPK Fact Sheet January 2010	F-7	(F)(3)	Appendix Page 485
2007-08 VPK vs NonVPK Comparisons on Kindergarten Screening	F-8	(F)(3)	Appendix Page 488
Priority 2: STEM			
STEM*florida* Plan	P-1	Priority 2	Appendix Page 491
FCR-STEM Female and Minority Initiative	P-2	Priority 2	Appendix Page 500
The PRISM Project	P-3	Priority 2	Appendix Page 600
Other			
REFERENCES	R-1	n/a	Appendix Page 604
Participating LEA Allocations	X-1	n/a	Appendix Page 606

Florida's Next Generation PreK-20 Education Strategic Plan

Adopted by the State Board of Education
November 2009



Mission *(our purpose, function, value)*



The mission of the State Board of Education *(S.1008.31, F.S.)* is to increase the proficiency of all students within one seamless, efficient system, by providing them with the opportunity to expand their knowledge and skills through learning opportunities and research valued by students, parents, and communities, and to maintain an accountability system that measures student progress toward the following goals:

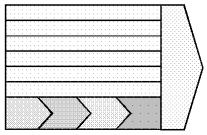
- Highest student achievement
- Seamless articulation and maximum access
- Skilled workforce and economic development
- Quality efficient services

Next Generation PreK-20
Strategic Vision *(what success looks like)*

To change the culture of our schools from PreK to postsecondary by raising the ceiling and raising the floor to better enable students for success in the 21st century.

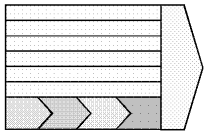
Next Generation PreK-20

Strategic Areas of Focus *(our goals)*



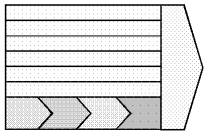
1. Strengthen foundation skills
2. Improve quality of teaching in the education system
3. Improve college and career readiness
4. Expand opportunities for postsecondary degrees and certificates
5. Improve K-12 educational choice options
6. Align resources to strategic goals

Next Generation PreK-20
Strategic Plan Crosswalk



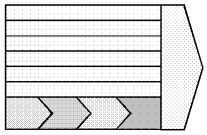
Former Eight Strategic Imperatives	Next Generation Six Areas of Focus
2: Set, Align, and Apply Academic Curricular and Testing Standards 3: Improve Students Rates of Learning	1. Strengthen foundation skills
1: Increase the Supply of Highly Effective teachers 4: Improve Quality of Instructional Leadership	2. Improve quality of teaching in the education system
6: Align Workforce Education with Skill Requirements of the New Economy	3. Improve college and career readiness
8: Improve Student Opportunities for Access and Advancement	4. Expand opportunities for postsecondary degrees and certificates
5: Increase the Quantity and Improve the Quality of Education options	5. Improve K-12 educational choice options
7: Align Financial Resources with Performance	6. Align resources to strategic goals

Next Generation PreK-20
Benchmarks



Focus Area 1: Strengthen Foundation Skills Objectives: • To increase rigor of standards to improve student achievement in VPK–12 • Utilize assessment to direct instruction and effect student outcome • Develop strategies to assist schools in need of improvement	**Performance Measures**							
	Baseline 2007-2008	**FY09**	**FY10**	**FY11**	**FY12**	**FY13**	**FY14**	**FY15**
1.1 The percentage of students scoring at or above grade level on FCAT Reading and Math, by elementary, middle, and high school	Reading 70% Elementary 61% Middle 42% High Math 70% Elementary 60% Middle 67% High	**Reading** **72% Elementary** **62% Middle** **42% High** **Math** **72% Elementary** **61% Middle** **69% High**						
1.2 Graduation Rates • Excluding GED • Including GED	73.1% Exclude 75.4% Include							
1.3 Number of Correct II and Intervene schools showing significant progress each year	273 Correct II 12 Intervene	**670 Correct II** **15 Intervene**						
1.4 Percentage of K-3 students in special education due to reading deficits	11.7%							

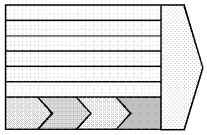
Next Generation PreK-20
Benchmarks



Focus Area 1 (continued): Strengthen Foundation Skills Objectives: • To increase rigor of standards to improve student achievement in VPK–12 • Utilize assessment to direct instruction and effect student outcome • Develop strategies to assist schools in need of improvement	**Performance Measures**							
	Baseline 2007-2008	FY09	FY10	FY11	FY12	FY13	FY14	FY15
***1.5**. Track cohorts of students who score "ready" on Kindergarten readiness assessment in Kindergarten and measure their performance on the third grade FCAT**								
***1.6** Track cohorts of students who score "not ready" on Kindergarten readiness assessment in Kindergarten and measure their performance on the third grade FCAT**								

** Future Measure*

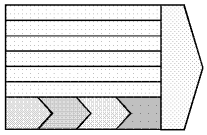
Next Generation PreK-20
Benchmarks



Focus Area 2: Improve Quality of Teaching in the Education System Objectives: • Establish the state's expectations for quality instructional practice • Improve the quality of preparation programs, professional development, and certification exams • Align requirements for district performance appraisal to the state's expectations • Provide statewide recognition and award programs that reward outstanding performance based on the state's expectations (includes student achievement)	Performance Measures							
	Baseline 2007-2008	FY09	FY10	FY11	FY12	FY13	FY14	FY15
2.1 Number and percent of teachers receiving state performance pay	16.2% 37,948 Excluding School Recognition ** 46.3% 108,893 Including School Recognition ** 234,951 Total Teachers **							

** *Updated with Final Survey 5 data*

Next Generation PreK-20
Benchmarks

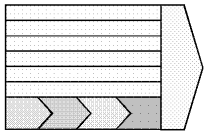


Focus Area 2 (continued): **Improve Quality of Teaching in the Education System** Objectives: • Establish the state's expectations for quality instructional practice • Improve the quality of preparation programs, professional development, and certification exams • Align requirements for district performance appraisal to the state's expectations • Provide statewide recognition and award programs that reward outstanding performance based on the state's expectations (includes student achievement)	**Performance Measures**							
	Baseline 2007-2008	**FY09**	**FY10**	**FY11**	**FY12**	**FY13**	**FY14**	**FY15**

2.2 Number and percentage of classes taught by out-of-field teachers in:
• All Schools
• Differentiated Accountability (DA) schools
• For critical teacher shortage areas:
  • Percentage of teachers teaching out-of-field
  • Number of completers from approved teacher preparation programs (SUS, CC, Educator Preparation Institute)
	All Schools:
	8.3%
	79,985 of 964,718 Total Classes
	DA:
	• Correct 1: 8.3%
	• Correct 2: 11.8%
	• Intervention: 10.1%
	• Prevent 1: 6.3%
	• Prevent 2: 15.1%
	Critical Teacher Shortage Areas:
	• Out-of-field: 8.9%
	• Completers (CC,SUS,EPI, Priv.): 1,961							

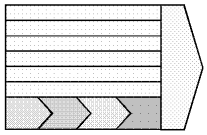
2.3 Number and percentage of new teachers who were math and science majors at a Florida Public College or University	Math 9.2% Science 41.8%**							

Next Generation PreK-20
Benchmarks



Focus Area 3: **Improve College and Career Readiness** Objectives: • Increase number and percentage of students scoring "college ready" in math and language arts on approved postsecondary readiness assessment • Increase number and percentage of high school students graduating with industry certification or Ready to Work Credential • Increase student participation and performance in accelerated options of AP, IB, DE, and AICE • Define College and Career Readiness	**Performance Measures**							
	Baseline 2007-2008	FY09	FY10	FY11	FY12	FY13	FY14	FY15
3.1 The percentage of students scoring Level 4 and 5 on FCAT Reading and Math, in elementary, middle, and high school	Reading 36% Elementary 27% Middle 20% High Math 38% Elementary 28% Middle 36% High	**Reading** **39% Elementary** **28% Middle** **19% High** **Math** **40% Elementary** **28% Middle** **38% High**						
3.2 Number and percentage of ninth-grade students who enrolled in Algebra I prior to ninth grade	31.7% 64,693 of 204,139 Total Graduates **							
3.3 Number and percentage of high school graduates who enrolled in at least one accelerated course during their high school career (AP, IB, DE, or AICE)	50.9% 75,200 of 147,879 Total Graduates **							

Next Generation PreK-20
Benchmarks

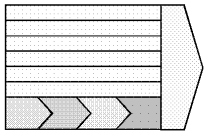


Focus Area 3 (continued): **Improve College and Career Readiness** Objectives: • Increase number and percentage of students scoring "college ready" in math and language arts on approved postsecondary readiness assessment • Increase number and percentage of high school students graduating with industry certification or Ready to Work Credential • Increase student participation and performance in accelerated options of AP, IB, DE, and AICE • Define College and Career Readiness	**Performance Measures**							
	Baseline 2007-2008	FY09	FY10	FY11	FY12	FY13	FY14	FY15
3.4 Number and percentage of students who enroll in accelerated courses that earned "postsecondary credit" in at least one accelerated course during their high school career (AP, IB, DE, or AICE)	61.8% 38,258 of 61,882 Graduates Who Enrolled in AP and/or DE ** 51.5% 38,626 of 75,074 Graduates Who Enrolled in AP or IB or DE							
3.5 *Number and percentage of students passing End-of-Course Exams* *								
3.6 Number and percentage of students enrolled in community college the year following high school graduation meeting approved postsecondary readiness standard via assessment in: • Math • Reading • Writing • In all 3 subjects	Math: 55.9% 27,430 of 49,110 Reading: 67.7% 33,691 of 49,778 Writing: 73% 36,333 of 49,778 All 3: 45.8% 22,467 of 49,027							

** Future Measure*

*** Updated with Final Survey 5 data*

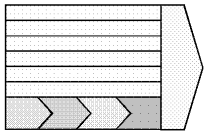
Next Generation PreK-20
Benchmarks



Focus Area 3 (continued): **Improve College and Career Readiness** Objectives: • Increase number and percentage of students scoring "college ready" in math and language arts on approved postsecondary readiness assessment • Increase number and percentage of high school students graduating with industry certification or Ready to Work Credential • Increase student participation and performance in accelerated options of AP, IB, DE, and AICE • Define College and Career Readiness	**Performance Measures**							
	Baseline 2007-2008	FY09	FY10	FY11	FY12	FY13	FY14	FY15
3.7 *Number and percentage of students passing postsecondary readiness courses while in high school, adult high school, or GED programs* *								
3.8 *Number and percentage of high school students graduating with the following *:* • *Industry Certification* • *Ready to Work Credential*								

* *Future Measure*

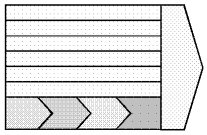
Next Generation PreK-20
Benchmarks



Focus Area 4: Expand Opportunities for Post-secondary Degrees and Certificates Objectives: • Increase postsecondary enrollment rate • Increase diversity and number of high school graduates who enroll in postsecondary education • Increase diversity and number and percentage of high school graduates who earn a certificate or a degree at a community college or career center • Increase diversity and number and percentage of community college or state university system students who enroll in and complete upper division program of study	Performance Measures							
	Baseline 2007-2008	FY09	FY10	FY11	FY12	FY13	FY14	FY15
4.1 Number and percentage of students who enroll in CC, SUS, ICUF, out-of-state, or technical centers in the year following high school graduation (disaggregated data available)	67.2% 95,300 of 141,882 Total Graduates **							
4.2 Of the students who enrolled in postsecondary following high school graduation, number and percentage of students who remain enrolled or exit with a credential after two and six years (disaggregated data available)	2 Years: CC: 81.2% 41,048 Enrolled Tech Ctr: 59.9% 1,531 Enrolled ** 6 Years: 47.5% 30,150 of 63,500 **							

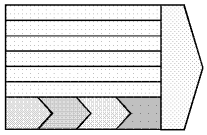
** *Updated with Final Survey 5 data*

Benchmarks



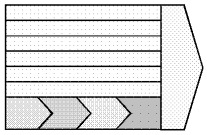
Focus Area 4 (continued): Expand Opportunities for Post-secondary Degrees and Certificates Objectives: • Increase postsecondary enrollment rate • Increase diversity and number of high school graduates who enroll in postsecondary education • Increase diversity and number and percentage of high school graduates who earn a certificate or a degree at a community college or career center • Increase diversity and number and percentage of community college or state university system students who enroll in and complete upper division program of study	Performance Measures							
	Baseline 2007-2008	FY09	FY10	FY11	FY12	FY13	FY14	FY15
4.3 The number and percentage of Associates' degree completers at a community college who transfer within two years to the upper division at a community college or university	1 Year: 56.6% 18,542 2 Years: 60.2% 19,465							
4.4 Trends in student enrollment in and completion of certificate and two year degree programs at community colleges	390,997 Enrollment 72,063 Completions							

Next Generation PreK-20
Benchmarks



Focus Area 4 (continued): Expand Opportunities for Post-secondary Degrees and Certificates Objectives: • Increase postsecondary enrollment rate • Increase diversity and number of high school graduates who enroll in postsecondary education • Increase diversity and number and percentage of high school graduates who earn a certificate or a degree at a community college or career center • Increase diversity and number and percentage of community college or state university system students who enroll in and complete upper division program of study	Performance Measures							
	Baseline 2007-2008	FY09	FY10	FY11	FY12	FY13	FY14	FY15
4.5 *Number and percentage of students who use an industry certification articulation pathway to enroll in a postsecondary program in the career area for which they were certified* *								
4.6 *Number and percentage of students who use an industry certification articulation pathway who subsequently complete a postsecondary program in the career area for which they were certified* *								

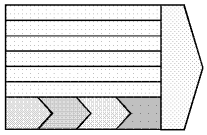
Next Generation PreK-20
Benchmarks



Focus Area 5: **Improve K-12 educational choice options** Objective: • Improve educational options for K-12 parents and improve student performance	**Performance Measures**							
	Baseline 2007-2008	FY09	FY10	FY11	FY12	FY13	FY14	FY15
5.1 Number and percentage of students (FTE) completing virtual education	.37% 9,686.52 of 2,631,277.10 Total Public School FTE							
5.2 The percentage of students attending a charter school scoring at or above grade level on FCAT Reading and Math, by elementary, middle, and high school	Reading 73% Elementary 66% Middle 40% High Math 70% Elementary 63% Middle 65% High	**Reading** **75% Elementary** **68% Middle** **38% High** **Math** **73% Elementary** **64% Middle** **64% High**						
5.3 Number and percentage of charter schools that earned an A or B	72.2% 156 of 216 Charter Schools							
5.4 *Number and percentage of high performing SES providers* *								
5.5 The percentage of students attending a charter school scoring level 4 and 5 on FCAT Reading and Math, by elementary, middle, and high school	Reading 38% Elementary 29% Middle 17% High Math 38% Elementary 28% Middle 32% High	**Reading** **41% Elementary** **31% Middle** **16% High** **Math** **41% Elementary** **29% Middle** **33% High**						

** Future Measure*

Next Generation PreK-20
Benchmarks

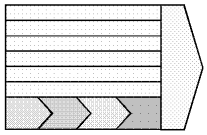


Focus Area 6:
Align Resources to Strategic Goals

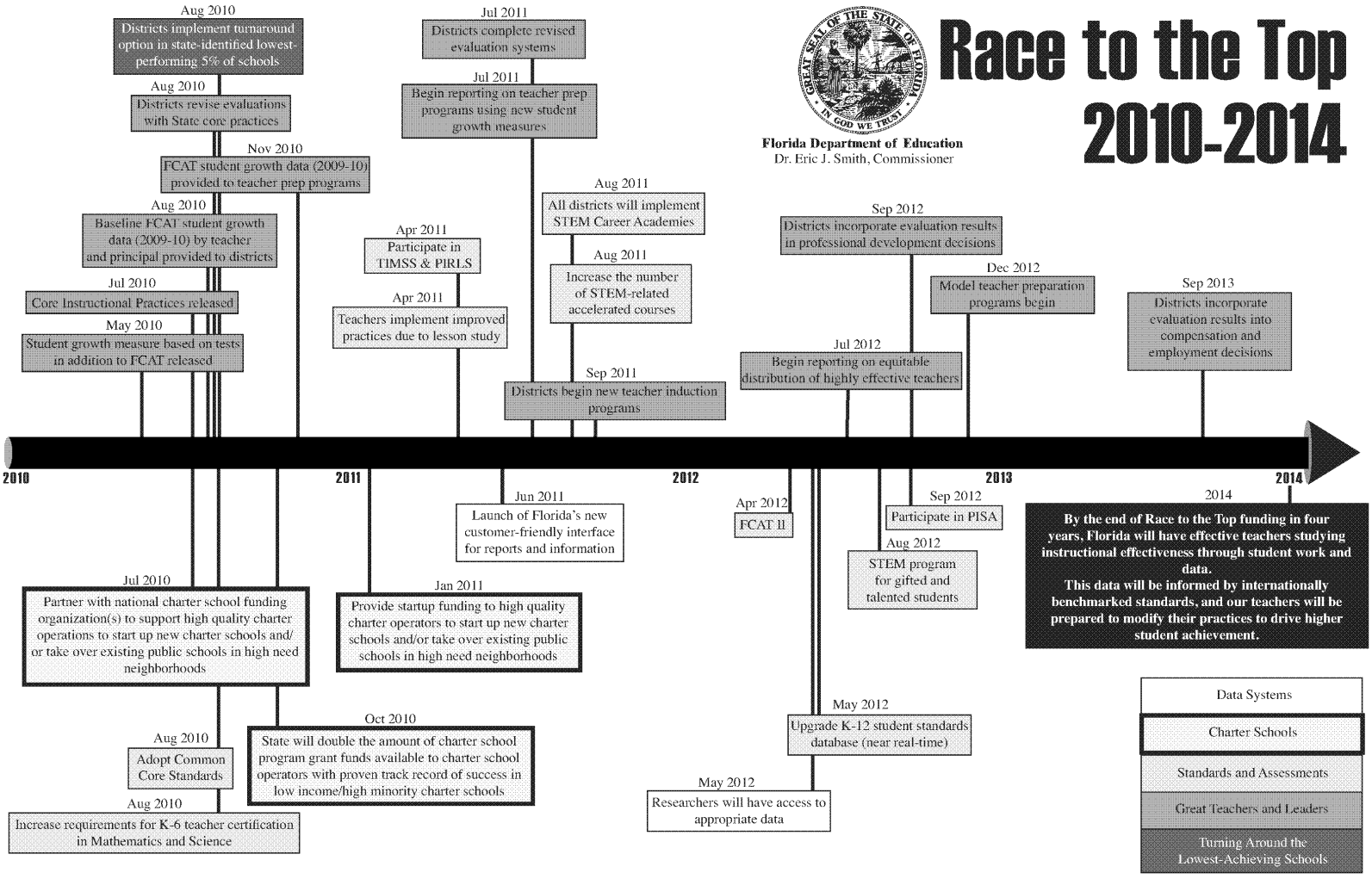
Objectives:

- Ensure funding and other resources are available to effectively and efficiently implement agency priorities

Next Generation PreK-20
Strategic Alignment



Focus Areas	2009-2010 Strategies
1. Strengthen foundation skills	1a) Update the Next Generation Sunshine State Standards / Common Core Standards 1b) Support struggling schools and districts 1c) Develop assessment systems to monitor student progress and provide information to improve instruction 1d) Reform and align the FCAT 1e) Enhance the full day Pre-Kindergarten Program for low income students 1f) Strengthen key grade transitions
2. Improve quality of teaching in the education system	2a) Strengthen the connection between teacher effectiveness and student performance 2b) Raise the standards for entry into the profession 2c) Maintain a highly effective workforce
3. Improve college and career readiness	3a) Improve the alignment of college readiness and remedial courses 3b) Update the Next Generation career and technical education standards 3c) Develop and implement end-of-course exams 3d) Provide greater emphasis on moving students to higher levels of proficiency 3e) Improve the alignment of high schools with college and career expectations
4. Expand opportunities for post-secondary degrees and certificates	4a) Improve postsecondary transitions from lower level to upper level 4b) Expand access to distance learning 4c) Develop Gold Standard Career Pathways 4d) Increase certificate and degree production
5. Improve K–12 educational choice options	5a) Strengthen the quality of school choice options 5b) Expand educational choice options
6. Align resources to meet strategic goals	6a) 2010–2011 Legislative Budget Request 6b) Alignment of 2009–2010 Federal Funds with Goals 6c) 2009–2010 Prioritization of Internal Operating Funds 6d) Management and Reporting of American Recovery and Reinvestment Act Funds 6e) Develop and Implement the Department Communication Plan 6f) Develop and Implement the State Technology Plan


Race to the Top
2010-2014
Florida Department of Education
Dr. Eric J. Smith, Commissioner
Aug 2010
Districts implement turnaround option in state-identified lowest-performing 5% of schools
Aug 2010
Districts revise evaluations with State core practices
Nov 2010
FCAT student growth data (2009-10) provided to teacher prep programs
Aug 2010
Baseline FCAT student growth data (2009-10) by teacher and principal provided to districts
Jul 2010
Core Instructional Practices released
May 2010
Student growth measure based on tests in addition to FCAT released
Jul 2011
Districts complete revised evaluation systems
Jul 2011
Begin reporting on teacher prep programs using new student growth measures
Aug 2011
All districts will implement STEM Career Academies
Aug 2011
Increase the number of STEM-related accelerated courses
Apr 2011
Participate in TIMSS & PIRLS
Apr 2011
Teachers implement improved practices due to lesson study
Sep 2011
Districts begin new teacher induction programs
Sep 2012
Districts incorporate evaluation results in professional development decisions
Dec 2012
Model teacher preparation programs begin
Jul 2012
Begin reporting on equitable distribution of highly effective teachers
Sep 2013
Districts incorporate evaluation results into compensation and employment decisions
2010
2011
2012
2013
2014
Jun 2011
Launch of Florida's new customer-friendly interface for reports and information
Apr 2012
FCAT II
Sep 2012
Participate in PISA
Aug 2012
STEM program for gifted and talented students
2014
By the end of Race to the Top funding in four years, Florida will have effective teachers studying instructional effectiveness through student work and data.
This data will be informed by internationally benchmarked standards, and our teachers will be prepared to modify their practices to drive higher student achievement.
Jul 2010
Partner with national charter school funding organization(s) to support high quality charter operations to start up new charter schools and/or take over existing public schools in high need neighborhoods
Jan 2011
Provide startup funding to high quality charter operators to start up new charter schools and/or take over existing public schools in high need neighborhoods
Oct 2010
State will double the amount of charter school program grant funds available to charter school operators with proven track record of success in low income/high minority charter schools
Aug 2010
Adopt Common Core Standards
Aug 2010
Increase requirements for K-6 teacher certification in Mathematics and Science
May 2012
Upgrade K-12 student standards database (near real-time)
May 2012
Researchers will have access to appropriate data
Data Systems
Charter Schools
Standards and Assessments
Great Teachers and Leaders
Turning Around the Lowest-Achieving Schools

PARTICIPATING LOCAL EDUCATION AGENCY

MEMORANDUM OF UNDERSTANDING

I. PURPOSE AND SCOPE OF WORK: An award of Race to the Top grant funds would position the Florida of Department of Education to weave a common core of rigorous standards and assessments into a pioneering data system that will serve as a foundation to attract, retain, and support top notch teachers and school leaders who will, in turn, improve student achievement in Florida's schools. By entering into this Memorandum of Understanding ("MOU"), Local Education Agencies ("LEAs") will indicate their commitment to these principles and their ability to ensure that these principles are implemented through their LEA plan.

This MOU is entered into by and between the Florida Department of Education ("Department") and _____ ("Participating LEA"). The purpose of this agreement is to establish a framework of collaboration, as well as articulate specific roles and responsibilities in support of the Department in its implementation of an approved Race to the Top grant application. Exhibit I, the Preliminary Scope of Work, indicates which portions of the State's proposed reform plans ("State Plan") the Participating LEA is agreeing to implement should the State's application be approved by the U.S. Department of Education ("ED").

In order to participate, the LEA must agree to implement all applicable portions of the State Plan, submit a statement of intent to participate by December 18, 2009, and return the executed MOU on or before January 12, 2010, to Holly.Edenfield@fldoe.org.

Nothing herein should be construed to obviate the responsibility of an LEA to comply with class size requirements.

II. PROJECT ADMINISTRATION:

A. PARTICIPATING LEA RESPONSIBILITIES: The Participating LEA will assist the Department in implementing the tasks and activities described in the State's Race to the Top application, should the State's application be approved by the ED and if the LEA is approved for a sub grant by the Department. Approval of the sub grant will be based upon the scope and quality of the LEA's proposed work plans and its capacity to implement the plans. To this end, the Participating LEA sub grantee will:

1) Implement the LEA plan as identified in Exhibit I of this agreement.

2) Actively participate in all relevant convenings, communities of practice, or other practice-sharing events that are organized or sponsored by the Department or by ED.

3) Post to any website specified by the Department or ED, in a timely manner, all non-proprietary products and lessons developed using funds associated with the Race to the Top grant.

4) Participate, as requested, in evaluations of this grant conducted by the Department or ED.

5) Be responsive to Department or ED requests for information including the status of the project, project implementation, outcomes, and any problems anticipated or encountered.

6) Participate in meetings and telephone conferences with the Department to discuss (a) progress of the project, (b) potential dissemination of resulting non-proprietary products and lessons learned, (c) plans for subsequent years of the Race to the Top grant period, and (d) other matters related to the Race to the Top grant and associated plans.

B. DEPARTMENT RESPONSIBILITIES: In assisting the Participating LEA in implementing its tasks and activities described in the State's Race to the Top application, the Department grantee will:

1) Work collaboratively with and support the Participating LEA in carrying out the LEA Plan as identified in Exhibit I of this agreement.

2) Timely distribute the Participating LEA's portion of Race to the Top grant funds during the course of the project period and in accordance with the LEA Plan.

3) Provide feedback on the Participating LEA's status updates, annual reports, any interim reports, and project plans and products.

4) Identify sources of technical assistance for the project.

C. JOINT RESPONSIBILITIES:

1) The Department and the Participating LEA will each appoint a key contact person for the Race to the Top grant.

2) These key contacts from the Department and the Participating LEA will maintain frequent communication to facilitate cooperation under this MOU.

3) Department and Participating LEA grant personnel will work together to determine appropriate timelines for project updates and status reports throughout the whole grant period.

4) Department and Participating LEA grant personnel will negotiate in good faith to continue to achieve the overall goals of the State's Race to the Top grant, even when the State Plan requires modifications that affect the Participating LEA, or when the LEA Plan requires modifications.

D. COLLECTIVE BARGAINING RESPONSIBILITIES: The parties to any applicable collective bargaining agreement will use their best efforts to negotiate any terms and conditions in the agreement necessary for the full implementation of the State Plan. The parties understand that the failure to negotiate any term or condition in a collective bargaining agreement necessary for full implementation of the State Plan will result in termination of the grant.

E. DEPARTMENT RECOURSE FOR LEA NON-PERFORMANCE: If the Department determines that the LEA is not meeting its goals, timelines, budget, or annual targets or is not fulfilling other applicable requirements, the Department grantee will take appropriate enforcement action, which could include a collaborative process between the Department and the LEA, or any of the enforcement measures that are detailed in 34 CFR section 80.43 including putting the LEA on reimbursement payment status, temporarily withholding funds, or disallowing costs.

III. ASSURANCES: The Participating LEA hereby certifies and represents that it:

1) Has all requisite power and authority to execute this MOU.

2) Is familiar with the State's Race to the Top grant application and is supportive of the goals and plans for implementation and is committed to working on all applicable portions of the State Plan.

3) Agrees to be a Participating LEA and will implement those portions of the State Plan indicated in Exhibit I, if the State application is funded.

4) Will provide a Final Scope of Work in a format provided by the Department. The Final Scope of Work will describe the LEA's specific goals, activities, timelines, budgets, key personnel, and annual targets for key performance measures ("LEA Plan ") in a manner that is consistent with the Preliminary Scope of Work (Exhibit I) and with the State Plan. The Final Scope of Work is due and must be submitted no later than 90 days after the grant is awarded to the State of Florida, should the State be awarded the grant.

5) Will propose a comprehensive, interconnected plan that will drive continuous improvement of students, teachers, and principals based upon specific goals and benchmarks. This comprehensive LEA plan will align all federal, state, and local resources and support systems, as appropriate, to maximize the LEA's capacity to implement the plan.

6) Will comply with all of the terms of the Grant, the Department's sub grant, and all applicable Federal and State laws and regulations, including laws and regulations applicable to the Program, and the applicable provisions of EDGAR (34 CFR Parts 75, 77, 79, 80, 82, 84, 85, 86, 97, 98 and 99).

IV. DEFINITIONS: The definitions found in the Race to the Top Application for Initial Funding apply to this MOU. In addition:

1) "High-minority school" means a school with a minority population that is within the top quartile of minority student membership in the state.

2) "High-poverty school" means a school in the top quartile as measured by the percentage of students receiving free and reduced lunch in the state.

V. MODIFICATIONS: This MOU may be amended only by written agreement signed by each of the parties to the MOU, and in consultation with ED.

VI. DURATION/TERMINATION: This MOU shall be effective beginning with the date of the last signature hereon and, if a grant is received, ending upon the expiration of the grant project period, or upon mutual agreement of the parties, whichever occurs first.

VII. SIGNATURES

Superintendent for the LEA:

_____

Signature/Date

_____

Print Name/Title

Chair of School Board for the LEA:

_____

Signature/Date

_____

Print Name/Title

Authorized Representative of Local Teachers' Union:

_____

Signature/Date

_____

Print Name/Title

Commissioner of Education:

_____

Signature/Date

_____

Print Name/Title

EXHIBIT I – PRELIMINARY SCOPE OF WORK

The LEA hereby agrees to participate in implementing the State Plan in each of the areas identified below.

Elements of State Reform Plans	Comments from LEA (optional)
Through Race to the Top, the Department is poised to weave a common core of rigorous standards and assessments into a pioneering data system that will serve as a foundation to attract, retain, and support top notch teachers and school leaders who will, in turn, improve student achievement in our schools.	
B. Standards and Assessments	
(B)(3) Supporting the transition to enhanced standards and high-quality assessments • The LEA will modify school schedules to allow for common planning time by grade level (elementary) or subject area (secondary) for lesson study focused on instructional quality, student work, and outcomes, without reducing time devoted to student instruction. The LEA will devote a minimum of one lesson study per week for each grade level or subject area. • The LEA will ensure that professional development programs at all schools focus on effective instruction consistent with new common core standards, while employing the principles of lesson study and formative assessment. The LEA will implement a system to evaluate the fidelity of lesson study and formative assessment implementation that is tied to interim and summative student assessments. • The LEA will implement at least one additional high school career and technical program that provides training for occupations requiring science, technology, engineering, and/or math (STEM). The LEA will pay, or secure payment for the industry certification examination for graduates of such programs. These programs must lead to a high-wage, high-skill career for a majority of graduates that supports one of the eight targeted sectors identified by Enterprise Florida and result in an industry certification. The LEA will ensure that these programs will include at least one Career and Technical Education course that has significant integration of math or science that will satisfy core credit requirements with the passing of the course and related end-of-course exam. • The LEA will increase the number of STEM-related accelerated courses, such as Advanced Placement, International Baccalaureate, AICE, dual enrollment, and industry certification. • The LEA will ensure that each school possesses the technology, including hardware, connectivity, and other necessary infrastructure, to provide teachers and students	

Elements of State Reform Plans	Comments from LEA (optional)
sufficient access to strategic tools for improved classroom instruction and computer-based assessment.	
C. Data Systems to Support Instruction	
(C)(2) Accessing and using State data • The LEA will assist in the design, testing, and implementation of initiatives to improve customer-friendly access and information to district leaders, teachers, principals, parents, students, community members, unions, researchers, and policymakers to effectively use state data systems. Examples of areas where the LEA will be required to assist the Department include providing assistance on defining state-level educational data that can be used to augment local data systems, implementing a single sign-on to access state resources, providing data to the Department, and testing other mechanisms that will enhance the usability of existing state-level applications to improve instruction and student learning. • The LEA will use state-level data that is published for use, along with local instructional improvement systems, to improve instruction.	
(C)(3) Using data to improve instruction: (i) Use of local instructional improvement systems • The LEA will use customer-friendly front end systems that are easy for students, teachers, parents, and principals to use and that show growth of students, teachers, schools, and districts disaggregated by subject and demographics. • An LEA that has an instructional improvement system will ensure that the system is being fully utilized; an LEA that does not have an instructional improvement system will acquire one.	
(ii) Professional development on use of data • The LEA will provide effective professional development to teachers and administrators on the use of its instructional improvement system. • The LEA will provide effective professional development to teachers and administrators on the use of state level data systems developed during the term of the grant.	
(iii) Availability and accessibility of data to researchers • The LEA will provide requested data from local instructional improvement and longitudinal data systems to the	

Elements of State Reform Plans	Comments from LEA (optional)
Department to support the Department's efforts to make data available to researchers for the purpose of evaluating the effectiveness of instructional materials, strategies, and approaches for educating different types of students and to help drive educational decisions and policies.	
D. Great Teachers and Leaders	
(D)(1) Providing high-quality pathways for aspiring teachers and principals	
(ii) Alternative routes to certification that are in use • The LEA will coordinate with institution preparation programs to provide effective district personnel to supervise pre-service teacher and educational leadership candidates. Such district supervising personnel will be highly effective teachers. • The LEA will use data from student performance and other continued approval standards in Rule 6A-5.066, F.A.C., to annually review and improve its alternative certification program and will deliver any professional development associated with the program in accordance with the state's protocol standards for professional development.	
(D)(2) Improving teacher and principal effectiveness based on performance	
(i) Measure student growth • The LEA will measure student growth based upon the performance of students on all state required assessments. For content areas and grade levels not assessed on state required assessments, then the LEA will use district-developed assessments aligned to state standards under s.1008.22, F.S.	
(ii) Design and implement evaluation systems • The LEA will design and implement a teacher evaluation system with teacher and principal involvement that: 1. Utilizes the Department-selected teacher-level student growth measure cited in (D)(2)(i) as the primary factor of the teacher and principal evaluation system. Primary is defined as greater than 50% of the evaluation. However, an LEA that completed renegotiation of its collective bargaining agreement between July 1, 2009, and December 1, 2009, for the purpose of determining a weight for student growth as the primary component of its teacher and principal evaluations, is eligible for this	

Elements of State Reform Plans	Comments from LEA (optional)
grant as long as the student growth component is at least 40% and is greater than any other single component of the evaluation. 2. Includes the core of effective practices that have been strongly linked to increased student achievement for the observation portion of the teacher evaluation. The principal, direct supervisor, and any other individual performing observation will use, at a minimum, this same core of effective practices. 3. Includes at least one additional metric to combine with the student performance and principal observation components to develop a "multi-metric" evaluation system for, at a minimum, the teachers who are in the year prior to a milestone career event, such as being awarded a multi-year contract, a promotion, or a significant increase in salary. Examples of additional metrics include, but are not limited to, observations by master teachers or instructional coaches, student input, peer input, and parental input. 4. Includes a comprehensive range of ratings beyond a simple satisfactory or unsatisfactory. • The LEA will design and implement a principal evaluation system with teacher and principal involvement that: • Utilizes the Department-selected teacher-level student growth measure as the primary factor of the teacher and principal evaluation system. Primary is defined as greater than 50% of the evaluation. • Utilizes the Florida Principal Leadership Standards with an emphasis on recruiting and retaining effective teachers, improving effectiveness of teachers, and removing ineffective teachers as the basis for the remaining portion of the evaluation. • The LEA will submit teacher and principal evaluation systems to the Department for review and approval. • The LEA will utilize student performance data on statewide assessments as a significant factor in the annual evaluations of district-level staff with supervisory responsibilities over principals, curriculum, instruction, or any other position directly related to student learning. • The LEA will report the results of evaluations of each teacher, principal, and district-level supervisor [as described	

Elements of State Reform Plans	Comments from LEA (optional)
in (D)(2)(ii)] to the Department during Survey 5. • Note: Each LEA will have the first year of the grant to develop and revise its evaluation system to meet these requirements. The Department will provide the core of effective practices by the end of the 2009-10 school year and other evaluation components as described above.	
(iii) Conduct annual evaluations **For Teachers:** • The LEA will conduct multiple evaluations for each first-year teacher that are integrated with the district's beginning teacher support program and include observations on the core effective practices described in (D)(2)(ii)2. and reviews of student performance data. • The LEA will conduct "multi-metric" evaluations as described in (D)(2)(ii) for teachers who are in the year prior to a milestone career event, such as being awarded a multi-year contract, a promotion, or a significant increase in salary. The LEA plan will include a definition of milestone career event. • The LEA will conduct evaluations as described in (D)(2)(ii)1, 2, and 4. for all other teachers at least once per year. **For Principals:** • The LEA will conduct evaluations as described in (D)(2)(ii) for principals at least once per year.	
(iv)(a) Use evaluations to inform professional development. The LEA will use results from teacher and principal evaluations as described in (D)(2)(ii) in its professional development system as follows: **For Teachers:** • Establish an Individual Professional Development Plan (IPDP) for each teacher that is, in part, based on an analysis of student performance data and results of prior evaluations. • Individualize the support and training provided to first- and second-year teachers and determine the effective teachers who will provide coaching/mentoring in the district's beginning teacher support program.	

Elements of State Reform Plans	Comments from LEA (optional)
For Principals: • Establish an Individual Leadership Development Plan (ILDP) for each principal that is based, in part, on an analysis of student performance data and results of prior evaluations.	
(iv)(b) Use evaluations to inform compensation, promotion, and retention • The LEA will implement a compensation system for teachers that: • Ties the most significant gains in salary to effectiveness demonstrated by annual evaluations as described in (D)(2)(ii), rather than to degree level or years of experience. • Implements statutory requirements of differentiated pay in s. 1012.22(1)(c)4., F.S., through bonuses or salary supplements. Categories for differentiated pay are additional academic responsibilities, school demographics, critical shortage areas (including STEM areas), and level of job performance difficulties (including working in high-poverty, high-minority, or persistently lowest-achieving schools). • Provides promotional opportunities for effective teachers to remain teaching in addition to moving into school leadership positions and bases promotions on effectiveness as demonstrated on annual evaluations as described in (D)(2)(ii), including a multi-metric evaluation in the year prior to promotion. • The LEA will implement a compensation system for principals that: • Ties the most significant gains in salary to effectiveness demonstrated by annual evaluations as described in (D)(2)(ii), rather than to degree level or years of experience. • Implements statutory requirements of differentiated pay in s. 1012.22(1)(c)4., F.S., through bonuses or salary supplements. Categories for differentiated pay are additional academic responsibilities, school demographics, critical shortage areas, and level of job performance difficulties (including working in high-poverty, high-minority, or persistently lowest-achieving schools).	

Elements of State Reform Plans	Comments from LEA (optional)
• The LEA will provide annually to the Department its salary schedule indicating how this requirement has been met.	
(iv)(c) Use evaluations to inform tenure and/or full certification • The LEA will base decisions to award employment contracts to teachers and principals on effectiveness as demonstrated through annual evaluations as described in (D)(2)(ii).	
(iv)(d) Use evaluations to inform removal • The LEA will base decisions surrounding reductions in staff, including teachers and principals holding employment contracts, on their level of effectiveness demonstrated on annual evaluations as described in (D)(2)(ii). When this factor yields equal results, seniority and other factors may be used in decisions. • The LEA will hold principals, their supervisors, and all LEA staff who have a responsibility in the dismissal process accountable for utilizing the process and timeline in statute (ss. 1012.33 and 1012.34, F.S.) to remove ineffective teachers from the classroom. • The LEA will report annually to the Department through Survey 5 the teachers and principals who were dismissed for ineffective performance as demonstrated through the district's evaluation system. • The LEA will report annually to the Department through Survey 5 the highly effective teachers and principals who have resigned or who are no longer employed by the District.	
(D)(3) Ensuring equitable distribution of effective teachers and principals:	
(i) High-poverty and/or high-minority schools • The LEA will develop a plan, with timetables and goals, that uses effectiveness data from annual evaluations as described in (D)(2)(ii) to attract and retain highly effective teachers and principals to schools that are high-poverty, high-minority, and persistently lowest-achieving. The LEA plan may also be designed to attract and retain new teachers from high performing teacher preparation programs as defined by the Department in the grant to these schools. • The LEA will implement a compensation system as described in (D)(2)(iv)(b) to provide incentives for	

Elements of State Reform Plans	Comments from LEA (optional)
encouraging effective teachers and principals to work in these schools. • The LEA will present a plan that includes strategies in addition to compensation to staff these schools with a team of highly effective teachers led by a highly effective principal, including how the success of these individuals will be supported by the district. • The LEA will report the effectiveness data of all teachers and principals annually during Survey 5.	
(ii) Hard-to-staff subjects and specialty areas • The LEA will implement a compensation system as described in (D)(2)(iv)(b) to provide incentives for the recruitment of effective teachers in these subjects and areas. • The LEA will implement recruitment and professional development strategies to increase the pool of teachers available in the district in these subject areas.	
(D)(5) Providing effective support to teachers and principals:	
(i) Quality professional development • The LEA will implement a district professional development system that utilizes the state's protocol standards for effective professional development as follows: **For Teachers:** • The LEA will modify school schedules to allow for common planning time by grade level (elementary) or subject area (secondary) for lesson study focused on instructional quality, student work, and outcomes, without reducing time devoted to student instruction. The LEA will devote a minimum of one lesson study per week for each grade level or subject area. • The LEA will ensure that professional development programs in all schools focus on the new common core standards, while employing the principles of lesson study and formative assessment. • Implement IPDPs for teachers based on analysis of student performance data and results of prior evaluations as described in (D)(2)(ii).	

Elements of State Reform Plans	Comments from LEA (optional)
• Implement a beginning teacher support program for teachers in the first and second year that integrates data from multiple evaluations, coaching/mentoring, and assistance on using student data to improve instruction; builds in time for observation of effective teachers; includes collaboration with colleges of education, as appropriate; and defines a clear process for selecting and training coaches/mentors. **For Principals:** • Implement professional development programs at all schools that focus on the new common standards. • Implement professional development based on the principles of lesson study and formative assessment as described by the Department in this grant and the process needed to implement lesson study in a school. • Implement ILDPs for principals based on analysis of student performance data and results of prior evaluations as described in (D)(2)(ii).	
(ii) Measure effectiveness of professional development • The LEA will evaluate professional development based on student results and changes in classroom/leadership practice (as appropriate for the teacher/principal).	
Toward the absolute priority of comprehensive education reform: • The LEA will document the use of Title II A funds specifically to supplement and enhance the initiatives implemented in this grant, including documentation in the district's budget for the first year and each subsequent year of the grant.	
E. Turning Around the Lowest-Achieving Schools	
(E)(2) Turning around the lowest-achieving schools • The LEA will select and implement one of the four school intervention models described in the grant application in all persistently lowest-achieving schools located in the district (see Appendix A to the MOU). The Department will identify the schools based upon the school categories devised for school accountability under s. 1008.33, F.S., and set forth in proposed Rule 6A-1.099811, F.A.C. (see Appendices B and C to the MOU). • An LEA with more than nine persistently lowest-achieving	

Elements of State Reform Plans	Comments from LEA (optional)
schools will not select the transformational option for more than one-half of the schools. • All actions undertaken by the LEA under this element of the grant will be in accordance with the requirements of s. 1008.33, F.S. (Differentiated Accountability). • The LEA will submit a plan for the Department's approval that implements one or more of the following programs in each persistently lowest-achieving school and within the feeder pattern of each persistently lowest-achieving high school: 1. In Intervene schools, the LEA will implement a schedule that provides increased learning time beyond the minimum 180 days and/or implement an extended school day, beyond the current hours of instruction. 2. The LEA will offer prekindergarten on a full day basis using the Department's Title I Full Day PreK model, for children residing in the attendance zone of such schools. 3. The LEA will expand opportunities for students to attend career and professional academies, especially STEM academies, under s. 1003.493, F.S. 4. The LEA will expand or introduce proven programs to encourage advanced classes, positive behavior support systems, mentoring, and curriculum that provide high-need students with college-ready skills. 5. The Department may approve other programs that demonstrate a strong record of improving student achievement in these district schools. • The LEA will use effectiveness data from annual evaluations to determine incentives for the most effective teachers to work in the district's elementary, middle, and high schools that are the persistently lowest-achieving. • The LEA will only assign new teachers (those in their first and second year) in the district's schools that are the persistently lowest-achieving if these teachers have completed or are participating in a high-performing teacher preparation program, as defined in the grant application. The LEA will ensure that such teachers are provided additional support by staffing a mix of new and proven teachers across all content areas and grade levels in the school.	
F. General	

Elements of State Reform Plans	Comments from LEA (optional)
(F)(2) Ensuring successful conditions for high-performing charter schools and other innovative schools • The LEA will offer charter schools located within their district the opportunity to participate in the grant on the same terms as any other district school. • Consistent with federal requirements, the LEA will ensure that participating charter schools receive a commensurate share of any grant funds and services funded by the grant. The LEA will provide data and reports necessary for the evaluation of the grant conducted by the Department's evaluation team and will require charter schools to provide the LEA with the data necessary for such evaluations.	

For the Participating LEA

_____
Authorized LEA Signature/Date

_____
Print Name/Title

For the Florida Department of Education

_____
Authorized State Signature/Date

_____
Print Name/Title

A-4: NAEP GOAL SUBGROUP DETAIL

NAEP GRADE 4 READING - % BASIC					
	Baseline (2006-2007)	(2008-2009): Reading Estimate; Math Baseline	Year 1 of Grant: (2010-2011)	Year 3 of Grant: (2012-2013)	State Goal (2018-2019)
State	**70%**	**73%**	**75%**	**78%**	**85%**
White	81%	82%	82%	83%	85%
Black	52%	58%	63%	69%	85%
Hispanic	64%	68%	71%	75%	85%
SWD	38%	43%	48%	57%	85%
FRL	59%	63%	68%	72%	85%
ELL	38%	39%	40%	51%	85%
Female	75%	77%	78%	80%	85%
Male	66%	69%	72%	76%	85%
NAEP GRADE 8 READING - % BASIC					
State	**71%**	**73%**	**74%**	**77%**	**85%**
White	80%	81%	82%	83%	85%
Black	54%	57%	61%	67%	85%
Hispanic	67%	70%	73%	76%	85%
SWD	36%	40%	44%	54%	85%
FRL	61%	64%	68%	72%	85%
ELL	40%	43%	47%	56%	85%
Female	78%	79%	80%	82%	85%
Male	66%	69%	72%	75%	85%
NAEP GRADE 4 MATH - % BASIC					
State	**86%**	**86%**	**88%**	**90%**	**95%**
White	94%	93%	93%	94%	95%
Black	71%	73%	77%	82%	95%
Hispanic	83%	84%	86%	88%	95%
SWD	63%	72%	77%	81%	95%
FRL	79%	80%	83%	86%	95%
ELL	64%	69%	72%	77%	95%
Female	86%	86%	88%	90%	95%
Male	87%	86%	88%	90%	95%

A-4: NAEP GOAL SUBGROUP DETAIL

NAEP GRADE 8 MATH - % BASIC					
State	**68%**	**70%**	**73%**	**76%**	**85%**
White	80%	80%	81%	82%	85%
Black	48%	53%	59%	66%	85%
Hispanic	61%	66%	70%	74%	85%
SWD	34%	39%	45%	55%	85%
FRL	55%	59%	64%	69%	85%
ELL	28%	30%	33%	46%	85%
Female	68%	69%	72%	75%	85%
Male	68%	71%	74%	76%	85%

Note: Some sub-groups have been excluded due to low sample size

NAEP GRADE 4 READING - Proficient and Advanced					
	Baseline (2006-2007)	**(2008-2009): Reading Estimate, Math Baseline**	**Year 1 of Grant: (2010-2011)**	**Year 3 of Grant: (2012-2013)**	**State Goal (2018-2019)**
State	**34%**	**35%**	**36%**	**38%**	**45%**
White	44%	44%	44%	45%	45%
Black	16%	18%	19%	26%	45%
Hispanic	28%	30%	32%	36%	45%
SWD	12%	13%	14%	22%	45%
FRL	22%	24%	26%	31%	45%
ELL	12%	13%	14%	22%	45%
Female	38%	39%	40%	42%	45%
Male	30%	31%	32%	35%	45%
NAEP GRADE 8 READING - Proficient and Advanced					
State	**28%**	**29%**	**30%**	**33%**	**40%**
White	36%	37%	38%	39%	40%
Black	13%	14%	15%	21%	40%
Hispanic	23%	25%	27%	31%	40%
SWD	7%	9%	10%	18%	40%
FRL	17%	18%	19%	24%	40%
ELL	7%	8%	9%	17%	40%
Female	34%	35%	36%	37%	40%
Male	22%	23%	24%	28%	40%

A-4: NAEP GOAL SUBGROUP DETAIL

NAEP GRADE 4 MATH - Proficient and Advanced					
State	**40%**	**40%**	**43%**	**46%**	**55%**
White	54%	53%	53%	54%	55%
Black	15%	20%	24%	32%	55%
Hispanic	33%	33%	35%	40%	55%
SWD	18%	26%	31%	37%	55%
FRL	25%	29%	34%	39%	55%
ELL	16%	19%	20%	29%	55%
Female	38%	39%	42%	45%	55%
Male	43%	42%	45%	47%	55%
NAEP GRADE 8 MATH - Proficient and Advanced					
State	**27%**	**29%**	**31%**	**33%**	**40%**
White	37%	39%	39%	39%	40%
Black	11%	13%	15%	21%	40%
Hispanic	21%	22%	24%	28%	40%
SWD	8%	8%	9%	17%	40%
FRL	16%	18%	21%	25%	40%
ELL	6%	4%	5%	14%	40%
Female	26%	27%	29%	32%	40%
Male	29%	31%	33%	35%	40%

Note: Some sub-groups have been excluded due to low sample size

A-5: FCAT SUBGROUP DETAIL

	Baseline (2008-2009)	Year 0 of Grant: (2009-2010)	Year 1 of Grant: (2010-2011)	Year 2 of Grant: (2011-2012)	Year 3 of Grant: (2012-2013)	Year 4 of Grant: (2013-2014)	State Goal (2019-2020)
FCAT and Alternate Assessments in Reading % Level 3 (Proficient) and Above							
State	**62%**	**63%**	**64%**	**66%**	**67%**	**68%**	**75%**
White	72%	72%	73%	73%	73%	73%	75%
Black	44%	46%	49%	51%	54%	57%	75%
Hispanic	57%	59%	60%	62%	64%	65%	75%
Asian	77%	77%	78%	78%	78%	78%	80%
Am. Indian	66%	67%	68%	68%	69%	70%	75%
Multiracial	70%	70%	71%	71%	72%	72%	75%
SWD	36%	38%	40%	43%	47%	51%	75%
FRL	52%	54%	56%	58%	60%	62%	75%
ELL**	42%	45%	47%	50%	53%	56%	75%
Migrant	40%	43%	46%	49%	52%	55%	75%
Female	64%	65%	66%	67%	68%	69%	75%
Male	59%	60%	62%	63%	65%	66%	75%
FCAT and Alternate Assessments in Math % Level 3 (Proficient) and Above							
State	**67%**	**68%**	**69%**	**71%**	**72%**	**73%**	**80%**
White	77%	77%	78%	78%	78%	78%	80%
Black	49%	52%	55%	57%	60%	63%	80%
Hispanic	64%	65%	67%	68%	70%	71%	80%
Asian	86%	86%	87%	87%	87%	88%	90%
Am. Indian	72%	73%	73%	74%	75%	76%	80%
Multiracial	71%	72%	73%	73%	74%	75%	80%
SWD	39%	43%	46%	50%	54%	58%	80%
FRL	57%	59%	61%	63%	65%	67%	80%
ELL**	51%	54%	56%	59%	62%	64%	80%
Migrant	53%	55%	58%	60%	63%	65%	80%
Female	67%	68%	69%	71%	72%	73%	80%
Male	68%	69%	70%	71%	72%	73%	80%

Florida's goal is to close the achievement gap by 2020. Despite the fact that the overall goal for the state is 75% in Reading and 80% in Math, there is a subgroup that has already surpassed this goal. Asian students are currently at 77% in Reading and 86% in Math. The state expects Asian students to keep improving in the following years. Thus the state has set a minimum level for 2020 for this subgroup of 80% for Reading and 90% for Math.

A-6 - HIGH SCHOOL GRADUATION AND COLLEGE READINESS GOAL SUBGROUP DETAIL

Increasing High School Graduation Rates						
	Baseline: (2009-2010)	Year 1 of RTTT Grant: (2010-2011)	Year 2 of RTTT Grant: (2011-2012)	Year 3 of RTTT Grant: (2012-2013)	Year 4 of RTTT Grant: (2013-2014)	2020 Goal
State	**65.5%**	**67.3%**	**69.4%**	**71.6%**	**75.0%**	**85.0%**
White	71.2%	72.4%	73.7%	75.0%	78.0%	85.0%
Black	53.7%	56.1%	59.2%	62.5%	67.0%	85.0%
Hispanic	63.4%	65.6%	68.6%	71.7%	75.0%	85.0%
Asian	83.4%	84.2%	85.5%	86.8%	88.0%	90.0%
American Indian	65.3%	67.3%	69.6%	72.0%	75.0%	85.0%
Multiracial	71.7%	72.8%	74.2%	75.7%	78.0%	85.0%
Male	59.9%	61.6%	63.8%	66.1%	69.7%	85.0%
Female	71.4%	72.5%	73.9%	75.4%	77.0%	85.0%
SWD	37.3%	37.7%	40.9%	44.4%	50.0%	85.0%
FRL	55.1%	55.7%	58.1%	60.7%	64.0%	85.0%
ELL	50.9%	52.7%	55.5%	58.4%	62.5%	85.0%
Migrant	52.4%	53.0%	55.7%	58.4%	62.5%	85.0%

Despite the fact that the overall goal for the state is 85%, Asian students are currently at 83%. The state expects Asian students to keep improving in the following years. Thus the state has set a minimum level for 2020 for this subgroup of 90%.

Increasing College Enrollment Rates *College enrollment is defined in this notice as the enrollment of students who graduate from high school consistent with 34 CFR 200.19(b)(1) and who enroll in an institution of higher education (as defined in section 101 of the Higher Education Act, P.L. 105-244, 20 U.S.C. 1001) within 16 months of graduation.*						
	Baseline: 2009-2010 (HS class of 2007)	Year 1 of RTTT Grant: (2010-2011)	Year 2 of RTTT Grant: (2011-2012)	Year 3 of RTTT Grant: (2012-2013)	Year 4 of RTTT Grant: (2013-2014)	2020 Goal (HS class of 2017)
State	**60.1%**	**60.2%**	**61.2%**	**62.2%**	**63.7%**	**70.0%**
White	62.1%	62.8%	63.5%	64.3%	65.7%	70.0%
Black	53.1%	53.8%	55.3%	56.9%	58.9%	70.0%
Hispanic	59.5%	60.5%	61.5%	62.5%	63.8%	70.0%
Asian	70.9%	71.3%	71.7%	72.1%	72.9%	75.0%
American Indian	61.5%	62.7%	63.6%	64.4%	66.0%	70.0%
Multiracial	57.9%	58.4%	59.5%	60.7%	63.0%	70.0%
Male	55.8%	56.9%	58.2%	59.5%	61.5%	70.0%

A-6 - HIGH SCHOOL GRADUATION AND COLLEGE READINESS GOAL SUBGROUP DETAIL

Female	63.9%	64.5%	65.1%	65.7%	67.0%	70.0%
SWD	40.0%	40.8%	43.1%	45.6%	49.0%	70.0%
FRL	51.9%	53.1%	54.7%	56.4%	59.0%	70.0%
ELL	51.2%	52.5%	54.2%	55.9%	58.5%	70.0%
Migrant	40.6%	41.4%	43.7%	46.1%	49.0%	70.0%

Despite the fact that the overall goal for the state is 70%, there is a subgroup that has already surpassed this goal. Asian students are currently at 71%. The state expects Asian students to keep improving in the following years. Thus the state has set a minimum level for 2020 for this subgroup of 75%.

Increasing College Credit Earning Rate						
	Baseline: 2009-2010 (HS class of 2005)	**Year 1 of RTTT Grant: (2010-2011)**	**Year 2 of RTTT Grant: (2011-2012)**	**Year 3 of RTTT Grant: (2012-2013)**	**Year 4 of RTTT Grant: (2013-2014)**	**2020 Goal (HS class of 2015)**
State	**63.0%**	**63.1%**	**63.3%**	**63.5%**	**63.7%**	**67.0%**
White	65.7%	65.9%	66.1%	66.3%	66.5%	67.0%
Black	54.4%	54.6%	55.9%	57.3%	58.7%	67.0%
Hispanic	59.1%	59.3%	60.1%	61.0%	62.0%	67.0%
Asian	77.9%	78.1%	78.3%	78.4%	78.6%	79.0%
American Indian	58.8%	59.0%	59.9%	60.9%	61.8%	67.0%
Multiracial	61.1%	61.3%	62.0%	62.7%	63.5%	67.0%
Male	58.4%	58.5%	59.3%	60.2%	61.0%	67.0%
Female	66.5%	66.6%	66.7%	66.8%	66.8%	67.0%
SWD	43.1%	43.2%	45.4%	47.6%	50.0%	67.0%
FRL	55.4%	55.5%	56.6%	57.7%	58.8%	67.0%
ELL	61.3%	61.5%	62.0%	62.6%	63.1%	67.0%
Migrant	54.2%	54.3%	55.5%	56.7%	57.9%	67.0%

Despite the fact that the overall goal for the state is 67%, there is a subgroup that has already surpassed this goal. Asian students are currently at 78%. The state expects Asian students to keep improving in the following years. Thus the state has set a minimum level for 2020 for this subgroup of 79%.

A7: SUPPORT FOR PARTICIPATING LEAs

STANDARDS AND ASSESSMENTS

- **Provide a Web-based interface** with single sign-on access and customer friendly navigation to a variety of digital resources including, but not limited to: multiple educational tools, student achievement data, and a list of instructional materials utilized by teachers whose instruction results in the greatest student achievement gains.

- **Update the Florida's Teacher Standards Instructional Tool to Common Core:**
  - Populate standards database with Common Core standards for easy access that include the following resources for teachers: Common Core skills-level information, cognitive complexity ratings for each standard to guide instruction and assessment, standards for student with disabilities, English Language Proficiency standards, performance descriptions with exemplars for each standards, and links to quality-reviewed model lessons.
  - Revise course descriptions and the course code directory that include the Common Core and Next Generation Sunshine State Standards.
  - Provide access to skills-level resources, including formative assessment tasks/scoring rubrics, through a graphical learning progressions menu of Common Core Standards and NGSSS and provide lesson study toolkits to support embedded professional development focused on (1) use of these assessments in instructional improvement and (2) research-based formative assessment practices.

- **Develop the Highly Effective Teacher Instructional Materials Database:** This database will be built for teachers to report the instructional materials they are using to support instruction of the Common Core plus NGSSS in science. The data system will be designed to generate reports of the instructional materials used in classrooms of highly effective teachers. This information will be available to guide districts and schools in making instructional materials decisions.

- **Update Student Standards Tutorial** to provide support for Common Core plus NGSSS in science, and Common Core summative assessments.

- **Postsecondary Text Demand Study**: To ensure alignment of the text demand of instructional materials used at the high school level in preparation for progression to the college level, Florida will conduct a survey of high school textbooks in Common Core and science courses with those being assigned to students in typical entry-level courses offered within the public, technical, community college, and university systems in Florida.

- **Increase Access to STEM Courses**. This initiative will provide an opportunity for consortiums that serve rural districts to compete for funds to build and implement model high school STEM programs of study for our gifted and talented students through a combination of virtual education (Florida is a national leader in this area), school of enrollment course work, post secondary study, accelerated course work, independent study that includes research, business/industry internships, and other options appropriate to the individual student being served.

DATA SYSTEMS TO SUPPORT INSTRUCTION

- **Publish relevant reports and information from state data resources.** The FDOE will publish state reports and information for education stakeholders that are intuitive, easy to navigate, and relevant. Examples of the types of reports generated are: educator preparation program evaluation, instructional materials effectiveness, student enrollment in accelerated STEM-related courses, and teacher & leader performance dashboards. FDOE will publish these reports and information and make them easily accessible by all via the customer-friendly web-based interface.

- **Create multi-media professional development materials to support participating LEAs' effective professional development efforts**. The FDOE will create multi-media professional development materials that encourage understanding and use of the customer-friendly web-based interface and state data resources. Since the FDOE will publish state data for incorporation into local instructional improvement systems [(C)(3(i)], these professional development materials also augment information and efforts to increase the adoption and use of local instructional improvement systems.
    - LEAs will be provided lesson study toolkits on the use of data on the Common Core standards and interim assessments through Standards and Assessment
    - LEAs will be offered leadership training in project management, data analysis, and strategic planning through Turning Around the Lowest-Achieving Schools
    - LEAs will improve the accuracy and usefulness of reporting and dissemination of results from professional development associated with each teacher and school principal through Great Teachers and Leaders.

- **Prepare LEA professional development staff to train local users to understand and use state data resources**
    - FDOE will provide direct support to LEA professional development staffs charged with helping educators acquire these new skills around the practical use of the data and facilitation of the accompanying cultural shift.
    - FDOE will prepare LEA professional development staff to deliver training and information on the use of state data resources through a train-the trainer model.

DOE will leverage the same organizational approach for working with LEAs as is used for Turning Around the Lowest-Achieving Schools by placing a professional development specialist in the five regions spanning Florida.

GREAT TEACHERS AND LEADERS

- **FDOE will provide a transparent process for districts and teachers to use the state measure**, along with support and models for measuring student growth in courses and grades not included in the state student assessment system.
    - FDOE will engage districts, educators and the public in extensive and transparent communication and education on the state's selected student growth measure, to ensure that the results are meaningful and useful in improving human capital decisions and student achievement.

- FDOE has already contracted services with a national expert to assist the FDOE and other stakeholders in selecting a measure to calculate student growth.
- FDOE will contract with an appropriate entity to work with the Department to annually and timely calculate student growth based on each student's performance on the state assessment and associated with each course and the responsible teacher and principal. Three years of baseline data will be provided to districts during the summer of 2010.
- To assist districts in expanding objective measures of student growth to courses other than reading and mathematics in grades four through ten, FDOE will contract with an appropriate entity to develop a method of calculating growth assessed by selected national assessments, such as tests required by advanced courses (such as Advanced Placement, International Baccalaureate, etc.) where no pretest is available (Fall 2011).

- By January 2011, through the competitive bid process, **FDOE will contract with an entity(ies) to develop mathematics, science, and social studies interim assessment item banks/test platforms**.
  - A contract will be issued to an appropriate entity for the development of Item Bank infrastructure with access to the test items for district-wide assessment-building purposes, specifically, interim assessment item banks/test platforms for K-8 Mathematics, Algebra I, Geometry, grades 5-8 Science, Biology, grades 3-8 Social Studies, and two high school Social Studies courses.
  - FDOE will enlist participating district representatives and representatives of state associations for these content areas to develop appropriate performance and peer-reviewed student assessments and will facilitate the incorporation of these in participating district assessment programs (and in involved districts who wish to do so).

- **FDOE will invest significant resources in securing an evaluator with specific expertise in education human capital**. This evaluation will include the effects of new student growth measures, evaluation systems, compensation programs and professional development on student performance, the teacher workforce and climate of our participating districts and schools.
  - FDOE will contract with national experts in teacher evaluation to provide face-to-face support to participating districts in re-developing their evaluation systems (year one). In years two through four, experts will continue supporting their districts with monitoring and feedback in the implementation of their evaluation systems.
  - FDOE will collect data from districts on evaluation results of teachers, principals and supervisors and analyze these data against student performance data, and will provide the results to participating districts for improvement and the public for awareness.

- **FDOE will support districts in restructuring compensation, employment, professional development and leadership opportunities** with a priority on student performance, so that highly effective individuals are retained in Florida, and especially with our most vulnerable students. In addition, FDOE will improve data reporting and analysis capabilities and leverage performance results at all levels to realize system-wide and student level success.
  - FDOE will evaluate each participating district's work plan based on whether it reflects the direct connection and feedback loop from formal and informal evaluation

results to professional development, especially in instituting lesson study and instructional coaching.
    - To monitor the use of compensation systems, FDOE will publish salary schedules in a manner easily accessible by the public and will report the status of districts in implementing this requirement.

- **FDOE will seek to award two to three entities that have proven records in improving leadership in schools** to implement streamlined, intensive, job-embedded school leadership preparation programs that will result in dual Level I and Level II school leadership certification for the completers. Because these programs are job-embedded, this will provide an opportunity for willing districts to benefit from a partnership with an outside entity with proven expertise in results-oriented leadership development.
    - FDOE will seek to award two to three entities that have proven records in improving leadership in schools to implement school leadership preparation programs that will result in dual Level I and Level II school leadership certification for the completers. These programs will be run in partnership with one or more school districts, as they must be job-embedded.

- **FLDOE will provide effective professional development to teachers and principals that results in improved student achievement**
    - Provide formative assessments in reading and mathematics (Section (B), Standards and Assessments)
    - Provide interim assessments in mathematics grades K-8, Algebra I, geometry; science 5-8, biology; social studies 3-8, and 2 high-incidence high school social studies courses (Section (B), Standards and Assessments). This will provide teachers and teacher leaders (as determined by participating districts) guided professional development opportunities to utilize items from these assessments to create other end of course or other district-wide assessments
    - Provide tool kits for teachers and leaders in data analysis and lesson study based on the newly-developed formative and interim assessments
    - Provide centralized and convenient access to follow-up training and trainer materials (including videos, pod-casts, etc.) for professional development in common core areas, instructional coaching, beginning teacher support, and methods of evaluation of professional development (Section (C), Longitudinal Data Systems)
    - Set guidelines for district development of beginning teacher support programs in collaboration with participating districts and two colleges of education who receive competitive grants to become research centers on teacher preparation and induction support.
    - Institute summer leadership academies that focus on lesson study and use of data for improving classroom instruction and student performance for school and teacher leaders in Differentiated Accountability schools
    - Conduct training for school boards in successful practices in school improvement and education human capital
    - Institute the Commissioner's Leadership Academy to build capacity for leadership at the district, region and state level
    - Coordinate the use of Title II A funds, as well as appropriate IDEA and Title I funds, at the state level and district on:

- Evaluation of teacher professional development based on change in classroom practice and student learning outcomes
- Training for teachers and principals in lesson study, coaching and classroom observations, and use of student data to drive instruction
- Training for teachers, principals, evaluators on the use of data from evaluations to guide professional development
- Create multi-media professional development materials that encourage understanding and use of the customer-friendly web-based interface and state data resources
- Improve the accuracy and usefulness of our reporting of and dissemination of results from professional development associated with each teacher and school principal
- FDOE will engage an appropriate entity with expertise in evaluation of professional development to work with districts in this area over the entire four years of the grant to provide needed follow-up and feedback on implementation.

STRUGGLING SCHOOLS

- **Extend Support to all Schools in the Lowest 5%**
  - The effective support that the DA Regional Teams provide to the state's lowest-performing schools will be expanded to include all schools identified in the lowest 5%.

- **Teacher Recruitment**
  - The FDOE will partner with organizations that recruit and train promising teachers for Miami-Dade and Duval school districts.

- **Leadership Pipeline for Turnaround Principals and Assistant Principals**
  - FDOE proposes to select a leadership preparation program partner through a competitive RFP process. The program will prepare aspiring school leaders to effectively address the teaching and learning challenges of chronically low-performing high schools in the lowest 5% and their feeder patterns. This objective will be achieved by working with seven urban school districts and institutions of higher education to annually recruit, train, and certify 80 to 100 new leaders committed to working with teachers, parents and community leaders to implement changes that are linked to increased student achievement.

- **Building District-Level Capacity for Turnaround in Rural Districts**

  - The state-led initiative is to partner with an outside provider to help build district leaders' capacity to support low performing schools in seven struggling, rural districts in Florida. The partner will adapt and deliver leadership modules and coaching targeted at improving the capacities of the superintendent, school board, and central office staff in districts with the state's lowest 5% of schools. District leaders will be guided in establishing strategic plans, bold goals, and evaluation systems that align district support to improve low performing schools. District leaders also will receive training in community involvement and developing a shared vision for improving schools.

- **Differentiated Accountability Summer Academy**:

- At the summer DA Academy, DA Regional Teams will provide professional development to instructional coaches, department chairs, and lead teachers from the state's lowest 5% of schools and their feeder patterns in the areas of lesson study, new standards, Response to Intervention (RtI), and the Florida Continuous Improvement Model (FCIM) over a two-year period in the summer.

- **Reading and Science, Technology, Engineering and Mathematics (STEM) Coordinators**

  - The reading focus of this state-led initiative is to hire 40 reading coordinators who will be distributed throughout the state and will be strategically assigned to schools in the lowest 5% and their feeder schools under the direction of the five DA Regional Teams. Coordinators will work specifically with school-site reading coaches that are assigned by districts to improve the implementation of reading intervention programs, assist with analyzing interim assessment data, implementation of lesson study, and direct instructional intervention based on the interim assessment data. Although the focus of the coordinators will be at the school-site, training will also be coordinated to train coaches and teachers district-wide in the areas of reading endorsement, reading interim assessments, and lesson study as well.

  - The STEM focus of this proposed state-led initiative is to hire 40 STEM coordinators who will be distributed throughout the state and be strategically assigned to schools in the lowest 5% and their feeder schools under the direction of the five DA Regional Teams. Coordinators will work specifically with school-site mathematics and science coaches that are assigned by districts to improve the implementation of new mathematics and science standards, start or improve implementation of the lesson study process in mathematics and science, assist with analyzing data from newly created and implemented interim assessments; and direct instructional intervention based on the data. A focus will also be placed on improving and expanding Career STEM Academies at the high school level.

- **Cultural Competency**

  - The initiative is to advance cultural competence by partnering with an outside provider to offer high-quality cultural competency training to high school leadership teams (i.e., principal, assistant principal, coaches, guidance counselors, department chairs) within the state's lowest 5% of schools. The focus of the training rests on leadership teams because the turnaround process begins with the leadership at the school site that creates the vision of the school and holds stakeholders accountable to implementing that vision. The training would also be extended to each of the DA Regional Teams to ensure that the principles of the training are supported and monitored throughout the year. The training will expand the DA Regional Team focus from issues related solely to teaching and learning to include the challenges that students in low-performing schools face. After the training, the school's leadership team will determine if they would like the training expanded to the entire faculty using the school's budgeted resources.

A-8: SUMMARY STATEMENTS OF SUPPORT

Florida's Legislative Leadership

The President of the Senate and Speaker of the House of Representatives support the principles reflected in the draft application and associated Memorandum of Understanding. Adequate objective measurement instruments whether are in place or are in the process of being developed to support linking teacher performance evaluations to student outcomes. The standard associated with these issues in the Memorandum of Understanding is the minimum standard we can support based on current law, and it is a legislative leadership priority to strengthen this standard during the upcoming legislative session. Florida's children deserve no less. We can and must do better.

The *President of the Senate and Speaker of the House of Representatives* and respective education committees express their combined support for Florida's efforts to apply for, and win the federal RTTT competition. The key assurances of this competition focus on areas that we consider to be the utmost importance in the advancement and success of our children and align well with our own state education goals. By concentrating on great teachers and leaders, high quality standards and assessments, a world class data system and our struggling schools, we can produce bold and effective strategies that will redefine the work going on in our classrooms and reinvigorate the learning experiences of every one of our students

As members of the *Florida Congressional Delegation*, we proudly support Florida's application submitted by Governor Charlie Crist for the federal RTTT competition. This important initiative provides an unprecedented opportunity to further Florida's ongoing education reform efforts and implement bold, forward-thinking strategies designed to strike at the heart of low academic achievement. Florida's application concentrates on quality teachers and leaders, superior standards and assessments, a world class data system and a renewed focus on struggling schools. These goals will reinvigorate classroom learning for each and every child across our diverse State. On behalf of the Florida Congressional Delegation, please accept our enthusiastic support as we work together to provide our children with the prosperous futures they deserve.

Charter Schools Association

The *Florida Consortium of Public Charter Schools* Board of Directors voted to endorse the State of Florida's application for RTTT funding. The Board enthusiastically supports the activities described in the RTTT summary provided. We are gratified to see that you included a requirement in the LEA Memo of Understanding that participating districts offer charter schools located within their district the opportunity to participate in the grant on the same terms as any other school district.

The *Florida Network of Public Charter Schools (FNPCS)* supports the FDOE's application for RTTT federal grant funds. The parallel goals of the FNPCS and FDOE's RTTT plan would foster synergized collaboration aimed at creating meaningful and lasting reform in Florida's schools, through the expansion of quality school choice options and the establishment of exemplars of educational excellence. It is our shared vision for the success of Florida's schools that the FNPCS fully endorses the FDOE's application for RTTT grant funding.

State and local leaders

The *Associated Industries of Florida*, the AIF board of directors and the thousands of employers we represent, wholeheartedly support the state's efforts to compete for and win federal RTTT funding. AIF applauds your work to improve the quality of teachers in Florida's classrooms, for we know the best tool for turning around low performing students is a high quality teacher.

The *Florida Association of District School Superintendents* supports Florida's efforts to secure this grant and appreciates the Commissioner of Education's willingness to involve superintendents in the process. The FDOE has been collaborating with the superintendents of Florida through the association to produce a viable application for the RTTT grant. We stand ready to provide further assistance during the next phase of this process.

The *Florida Association of Realtors* expresses strong support for the FDOE's RTTT grant application. Florida's young people deserve a high quality, cutting-edge education system to prepare them to compete in today's global economy. Commissioner, we stand with you in this amazing endeavor and we appreciate your vision. Together we will give Florida a brighter future.

The *Florida Board of Governors* is pleased to offer this letter of support for the FDOE's RTTT grant proposal, which lays out bold, historic steps that will help elevate K-12 education in Florida. The efforts will strategically address our state's greatest challenges while building on the significant achievements our system has already made.

The *Florida Chamber of Commerce* wholeheartedly supports the state's efforts to compete for and win this national competition. As we build on more than a decade of education reforms that continue to garner unprecedented student achievement…our efforts will deliver a learning environment that prepares our students for a vast and competitive global economy.

The *Florida Commission on Human Relations*, the state's civil rights agency, expresses strong support for the RTTT initiative and the need for Florida to be involved in this unique opportunity as one of the initial participants. The Commission supports the RTTT funding opportunity and believes it is in the best interest of Florida's children.

The *Florida Council of 100* fully supports Florida's RTTT application. The council is a private, nonprofit, nonpartisan organization of business leader, which exist to promote the economic growth of Florida and improve the economic well-being and quality of life of its citizenry. The council stands ready to help the state capitalize on this once-in-generation opportunity for Florida's students, teachers, and principals – the foundation of our 21st century economy.

The *Florida Education Foundation*'s Board of Directors strongly supports Florida's RTTT funding application and stands ready, willing and able to assist as necessary to ensure that Florida receives the funding that our students so desperately need. The Florida Education Foundation is the Direct Support Organization of the FDOE.

The *Florida Education Fund* whose mission is to strengthen the, larger community by creating and implementing programs and services that lead to institutional enhancement and greater educational advancement for historically under-represented groups supports the FDOE's RTTT proposal without reservation.

The *Florida Energy Workforce Consortium* fully supports Florida's RTTT application. As an industry consortium laser-focused on the energy sector's workforce challenges, we know how critical student achievement is to the success of our energy workforce of the future and the success of Florida's economy.

The *Florida Philanthropic Network* as a statewide association of Florida grant making foundations who invest in the improvement of the quality of life of Florida citizens wishes to express support of Florida's efforts to participate in the federal RTTT competitive funding process. Florida's participation in RTTT would provide a powerful catalyst to the state's private philanthropic efforts around education.

The *Florida School Boards Association, Inc.* endorses and supports Florida's efforts to participate in the RTTT programs as proposed by USDOE. The funding and innovations in this program are fully supported by our Association and the majority of school boards throughout the State. Our partnership will ensure that this program will be communicated effectively to all school districts and are more than willing to assist in all efforts to make Florida the model for the nation.

Florida Tax Watch wholeheartedly supports the state's efforts to compete for and win this national competition. Our state's economic and financial future depends on a skilled and highly-trained workforce. The students of today represent the community leaders, business owners and entrepreneurs of tomorrow.

The *Foundation for Florida's Future* supports the FDOE's application for the $4.6 billion competitive grant program, RTTT, from the USDOE. More than a decade of bold reforms has demonstrated Florida's unwavering commitment to transforming the quality of education. The success of the state's RTTT has the potential to shape the future of education in our nation.

The Greater Fort Lauderdale/Broward Economic Development Alliance supports Florida's RTTT program funding request. Today's students will be the business owners, managers and community leaders of tomorrow and it is imperative they be ready to compete with other businesses and communities around the world if Florida is to succeed.

Gulf Power Company offers their continued support of the FDOE's efforts to raise the educational achievements of our state's students through this RTTT application.

Indiantown Western Martin County Chamber of Commerce fully supports the state's application for federal funding.

The *Southern Poverty Law Center* has worked to improve state juvenile justice systems throughout the South. This work has led us to the schools, due to inappropriate and ineffective

school discipline practices that adversely impact the number of children referred to the juvenile justice system. To that end, we were pleased to see the USDOE's inclusion of Positive Behavioral Interventions and Supports and school climate issues in the final RTTT guidelines and even more pleased when the FDOE chose to make this program part of its RTTT application. We support Florida's RTTT application and look forward to our continued work together.

Space Florida wishes to express its wholehearted support with regard to the FDOE's submission for RTTT. Space Florida supports the FDOE in its targeted expansion of science, technology, engineering and mathematics (STEM) opportunities for all Florida students.

STEMFlorida's mission is to make Florida a leader in market relevant STEM talent development and retention. We stand in support of the RTTT vision and the action to make a more effective educational system a reality for Florida's students.

Stuart/Martin County Chamber of Commerce supports the FDOE's effort to win this national competition. We are confident this program will provide our teachers the resources to provide our students with the necessary skills to succeed.

The *Upper Tampa Bay Regional Chamber of Commerce* expresses strong support to Florida's submission for a RTTT grant. There is no question that our children are this state's and this nation's most precious resource and that we need to take very possible step to provide them the opportunity for a successful path in an increasingly global economy. RTTT is a tool tat we must put in the kit to do this.

Workforce Florida, Inc. commends the Department of Education for its commitment to improving and transforming the way students learn in our state. We stand in support of this unprecedented opportunity to make the vision for a more effective education system a reality for Florida's students.

Parent, Student and Community Organizations

The *Consortium of Florida Education Foundations*, which represents 54 county 501c3 non-profit education foundations, recognizes Florida's application for RTTT funding as once-in-a generation opportunity to bring transformative, positive changes to public education in our state and offer its full support.

The *Florida After School Network*, a non-profit organization invested in the future wellbeing of our children and our state, expresses overwhelming support for Florida's efforts to participate and ultimately triumph in the federal RTTT competition. Our mission is to ensure that every child has high-quality after school opportunities that are accessible, affordable, accountable and inclusive. An opportunity like this is too valuable to waste and it's going to take a combined effort by every one of us if we are to win this competition.

The *Florida PTA*, the largest child advocacy organization in Florida, is pleased to express support for Florida's efforts to participate, and ultimately triumph in the federal RTTT competition. Although Florida has accomplished much in the last decade through innovative

education reform and successful partnerships with key organizations such as Florida PTA, there still is much to be done, in order to provide all the children in Florida with an equal, high quality of education. We recognize the value of this opportunity and understand that it will take a combined effort by every one of us if we are to win this competition. Please accept our wholehearted support for your efforts as you work to make Florida a part of this momentous event.

The *Florida State Conference NAACP Branches,* a non-profit civil rights organization, expresses overwhelming support for Florida's efforts to participate, and ultimately triumph in the federal RTTT competition. Our state's prosperity depends largely on the successful outcome of our children, and the ability of our schools and communities to develop purposeful thinkers and leaders who are driven to succeed.

Institutions of Higher Education

Broward College supports Florida's RTTT program funding request. In Florida, education sectors at all levels are partnering with each other and the business community. What better reassurance or recognition for these successes than the RTTT award which would provide the much needed additional resources required implementing and complementing the goals?

Broward College, Educator Preparation Institute proudly supports the State of Florida's RTT program funding request. Florida's Strategic Plan has laid the foundation for educational reform goals to Strengthen Foundational Skills, Improve College and Career Readiness, Improve the Quality of Teaching, and Improve K-12 Educational Choice Options. Broward College's Educator Preparation Institute stands ready to support the RTTT vision.

Central Florida Community College enthusiastically lends support to the FDOE to procure the RTTT grant.

Chipola College is pleased to support the Florida grant proposal, RTTT. I have every expectation that the grant will improve student achievement in this state and serve as s a model for other states.

Daytona State College supports the FDOE's application for RTTT funding. Daytona State College commits to support the FDOE as it pursues educational excellence through the RTTT grant program.

Edison State College offers their strong support for the FDOE's proposal for RTTT. Building upon the strong foundation of experience and dedication within our state, I am confident the State of Florida can exceed the expectations within the RTTT program.

Edward Waters College, Department of Teacher Education/Center for Urban Education is an enthusiastic partner with the FDOE in the RTTT grant proposal. We believe that this innovative opportunity will assist the state and this college with preparing, recruiting, retaining and compensating the most effective teachers and leaders.

Florida Agricultural and Mechanical University is very pleases to provide this letter of support for Florida's RTTT Initiative. The Florida Agricultural and Mechanical University is in an excellent position to provide strong and continuous support for Florida's RTT Initiative.

Florida Atlantic University provides strong support for the FDOE's RTTT application. We see multiple opportunities to leverage this potential funding and historically strong partnership relationships to improve student learning from pre-kindergarten years through graduate students across the state.

Florida Gulf Coast University is pleased to support the FDOE's application for RTTT funding. It is Florida Gulf Coast's intent to assist and support our public school partners who participate in RTTT initiatives.

Florida International University supports Florida's strategic plan for garnering a federal RTTT grant. The plan promotes the importance of higher education and career readiness for our students and will develop a wide range of preparedness and professional development programs for our teachers.

The *Florida Institute of Technology's Department of Science and Mathematics* has considerable expertise and experience in STEM education and look forward to supporting initiatives outlined in the FDOE's RTTT proposal.

Florida Keys Community College provides full support for the FDOE in order to be able to continue to build upon a decade of tremendous improvements that have transformed our public education system into a national model of advancement. At the heart of RTTT is improving student learning and achievement. The areas targeted in this plan will assure that graduates have bright futures and are ready to enter college or the workforce.

Florida State College at Jacksonville with great enthusiasm supports Florida's grant application to the USDOE for RTTT. We look forward to working with our local school districts and FDOE in implementing these far reaching plans to improve student achievement, college and career readiness.

Gulf Coast Community College, Educator Preparation Institute supports Florida's RTTT application. The state of Florida is prepared to move forward to implement rigorous standards and assessments, within an assessment system, that will improve every facet of educational system. Florida's RTTT provides an opportunity for all educational partners to work toward this common vision.

Hillsborough Community College offers their support to the FDOE's RTTT grant proposal. The RTTT grant will enable the state to continue to increase student achievement throughout all of K-12 and ultimately all of education with continued implementation of rigorous standards and assessment supported by a culture of evidence.

Indian River State College supports the FDOE's RTTT application and looks forward to partnering with them in any way possible to ensure statewide educational success. Students in

the state of Florida deserve a world class, cutting edge education system to compete in today's global economy and RTTT can, and will, be the catalyst that delivers this to them.

Jacksonville University fully supports the FDOE's application for funding via the RTTT grant. This grant will vastly impact the ability for all collaborative partners to improve the delivery of education at every facet of our educational system in Florida.

The *Jacksonville University, School of Education*, fully supports the FDOE's application for funding via the RTTT grant. This grant will vastly impact eh ability for all collaborative partners to improve the delivery of education at every facet of our educational system in Florida.

Lake City Community College is most supportive of your efforts, ideas and therefore, your application for the money to begin putting your plan into effect. We appreciate the steps you are taking and realize the results will show a significant and positive impact on the students, the educational institutions, and therefore, the entire State of Florida.

Lake Sumter Community College commends the FDOE for this well planned, research based approach to achieving the RTTT goals. Florida's proposes a bold and ambitious plan that builds upon the foundation of innovation and improvement in Florida's public schools while honestly addressing our weaknesses as well. Please know that you can count on our institution to support our local school districts in their efforts to improve student success through the sorely needed resources this grant will provide.

Miami Dade College supports Florida's application for an FDOE RTTT grant. It is imperative that we be able to recruit and retain highly qualified teachers in the STEM disciplines who will ignite student's passion and interest, and prepare them to graduate from high school ready for rigorous postsecondary experiences in these disciplines.

New College of Florida extends their full support for the full support for the FDOE's RTTT grant proposal. The progressive design of this proposal surely promises to strengthen our corps of dedicated teachers and school leaders and enhance school achievement.

North Florida Community College supports Florida's RTTT initiative. Our college stands ready to do its part in this historic moment when Florida becomes a national and world leader in preparing its children for success.

Northwest Florida State College fully supports the proposal. Florida's RTTT application outlines an integrated approach to improve every facet of the education system. This is a truly remarkable proposal that, in my judgment, could have a significant impact on our students.

Palm Beach Community College notes that it is a distinct pleasure to offer our support for the Florida RTTT application. We stand ready to be an active partner as Florida's education system "races to the top".

Pasco-Hernando Community College supports the FDOE's application for RTTT funding. We recognize and value our role with the Hernando County and Pasco County School Districts and

would endeavor to enhance our collaboration even further if Florida receives this unique funding opportunity.

Pensacola Junior College offers enthusiastic support to Florida's RTTT application. As we continue to contribute to the ling-term intellectual and economic potential of both the region and the state, through innovative and affordable means to maximize student success and workforce productivity, we are fully committed to Florida's RTTT initiative implementation.

Polk State College's Educator Preparation Institute supports the State's RTTT application. The Institute will commit to the principles of the State's RTTT application and ensure that the principles that are applicable to alternative certification programs are implemented at Polk State College.

South Florida Community College offers support for the RTTT grant application. Much can be achieved through cooperation and strong partnerships between schools and colleges working together, and we stand ready to offer our commitment to achieve these ends.

St. Petersburg College stands ready to assist as we strive to provide our students with quality education and tools for success.

State College of Florida wholeheartedly supports the FDOE's grant request for RTTT. State College of Florida agrees with the mission of the FDOE's endeavor and is proud to support it in any manner.

The Florida State University is excited to support FDOE's application and looks forward to working together to best serve the needs of the state. You will have our full support in proceeded with this application, we will do all we can to assist you in the continuing development of an outstanding program should you be awarded the grant.

The *University of Central Florida* strongly supports the state of Florida's application for RTTT. The proposal's emphasis on the STEM disciplines supports the highly effective programs we have developed in partnership with the National Science Foundation and with the state of Florida to recruit, retain, and graduate students in science, technology, engineering and mathematics.

The *University of Central Florida's, College of Education* is committed to collaborate with the FDOE and LEA's in achieving the goal of improving student performance through the judicious use of state and federal resources provided by RTTT.

The *University of Florida* supports the State of Florida's application for RTTT. We support the vision and goals of the application because they will result in a more educated citizenry capable of building a stronger economy and enjoying a higher quality of life. RTTT offers a clear path to realize that goal, and we look forward to participating in its implementation.

The *University of Florida, College of Education* believes that Florida's application for federal funding through the RTTT initiative is a welcomed opportunity to engage various stakeholders

throughout the state in improving student achievement outcomes through attracting, preparing, retaining, and supporting excellent teachers and school leaders.

The *University of Miami, School of Education* is pleased to offer its support, not only to the FDOE, but to our LEA as well, the Miami-Dade County Public Schools. The university of Miami School of Education is proud to ally itself with the state and the LEA to assist in the realization of this important and vital vision.

The *University of North Florida* offers full support for the RTTT grant application. There is no doubt that improving education in Florida requires the state to recruit, prepare and retain a host of talented and dedicated education professionals.

The University of West Florida stands ready to assist the FDOE in the implementation of the ambitious goals set out by the administration of the RTTT. The Commissioner of Education and the FDOE have the capability to coordinate all levels of education throughout the state of Florida to achieve solid partnerships to be successful in this endeavor.

The University of West Florida, Educator Preparation Institute, is pleased to support the FDOE's RTTT grant proposal. Today, the state of Florida serves as one of the leaders in creating various models to prepare highly qualified teachers and has provided an open door for alternative pathways to teaching.

The *University of South Florida* enthusiastically supports Florida's RTTT proposal. Educators, policy makers, community leaders and philanthropic organizations have come together in support of educational reforms that will restore America's rightful place as the world leader in educational attainment rates. Please know that our words of support are backed by a sincere offer of assistance.

University of South Florida's, College of Education is pleased to offer support for the potential that Florida's Race to the Top proposal holds. Working with the FDOE, and all stakeholders, we will continue our commitment to preparing great teachers and leaders, conducting research to enhance student learning and to improve educational practice.

A9: Florida School Choice Options

Florida Continues to Lead the Nation

April 2009

FLORIDA DEPARTMENT OF EDUCATION

Improving K-12 Educational Choice Options

Production of this publication was a cooperative effort between
the Office of Independent Education and Parental Choice
and
the Bureau of Public School Options, K-12 Public Schools
in the Florida Department of Education.

For additional information about school choice options,
call the toll-free School Choice Hotline at:

(800) 447-1636

Detailed information about the school choice options described in this
document is available on the Department of Education Web site at:

http://www.floridaschoolchoice.org/
and
http://www.fldoe.org/flbpso/

Table of Contents

Florida: Leading the Nation in School Choice Options 1
Scholarship Programs 2
John M. McKay Scholarships for Students with Disabilities Program . 2
Corporate Tax Credit Scholarship Program 4
Scholarship Funding Organizations and Private Partners 4
Opportunity Scholarship Program - Public School Option 5
Charter Schools 6
Charter Technical Career Centers 7
Virtual Education 8
Florida Virtual School 8
K-8 Virtual School Programs 9
School District Virtual Instruction Program 9
Florida's Voluntary Public School Choice Program 10
Controlled Open Enrollment 11
Other Public School Options 11
Magnet Schools 11
Career and Professional Academies 12
Dual Enrollment 12
Advanced Placement (AP) Program 12
Advanced International Certificate of Education (AICE) Program 12
International Baccalaureate (IB) Diploma Program 12
No Child Left Behind School Choice 13
Home Education 14
Private Schools 15
Conclusion 15

"Supporting school choice options is a valuable way for families and their communities to work together to create the educational setting the best suits the needs of their children. School Choice is a key component to any successful education system"

— Commissioner of Education, Dr. Eric J. Smith

"Choice is a catalyst for change. By providing the benefits of a tailored learning experience for students, school choice provides parents access to opportunities for their children to thrive and succeed."

— Chairman of the State Board of Education, T. Willard Fair

FLORIDA: LEADING THE NATION IN SCHOOL CHOICE OPTIONS

School choice is a key component in helping to ensure high academic achievement for all of Florida's children. Florida continues to be in the forefront of innovation in providing school choice options for families. Access to these diverse school environments and programs empowers parents as they become managers of their children's education. Opportunities in school choice continue to grow, and an increasing number of families are taking advantage of their right and responsibility to select the learning environment that will help their children thrive.

Adopted in 1996, Florida's A+ Education Plan spurred the creation of policies and programs that thrust Florida into the spotlight as a national leader in providing school choice options. A key principle of the plan is for every student to gain a year's worth of knowledge in a year's time. If the schools that students are assigned to attend cannot provide this, parents should be free to choose another school that best meets the learning needs of their children.

Florida's State Board of Education has adopted six Strategic Areas of Focus as part of a long-range planning effort to improve Florida's educational system. One of the areas, ***Improve K-12 educational choice options,*** places a priority on giving families greater choice in quality educational opportunities. Support for this initiative, coupled with Florida's groundbreaking legislation, results in choice programs and resources that continue to expand to meet the needs of families. These programs allow children to get the education they deserve while simultaneously providing an incentive for innovation and improvement across the educational system.

Thousands of families and students benefit from school choices in Florida. Over the last four school years, almost one-fourth of Florida's K-12 public school students have attended a school other than the one to which they were assigned according to school district attendance zones. While school district enrollment for the 2008-09 school year has not been finalized, initial data show a slight increase in the percentage of families using school choice options.

K-12 Student Participation in Florida's School Choice Options

Year	Total K-12 Public School Student Membership	Number of Students Attending Schools Based on Parental School Choice Options	Percent of Students Attending Schools Based on Parental School Choice Options
2007-08	2,652,684	645,184	24%
2006-07	2,946,463	667,115	23%
2005-06	2,901,455	656,988	23%
2004-05	2,912,326	645,442	22%

School choice is not about one type of school being better than another. It is about letting parents who know the personality, strengths, and weaknesses of their child make the decision about how and where their child will be educated. School choice is the right thing to do for children and a good thing to do for schools. Ultimately, school choice improves education for all children.

Florida's emphasis on providing numerous school choice options for families and students is based on three basic principles:

- **Every student has different learning needs so there is no one best school for everyone**
- **Diversity in school structure and programs is necessary to accommodate all students and enable them to succeed**
- **Students will achieve more if they and their parents or guardians have freely chosen a learning environment.**

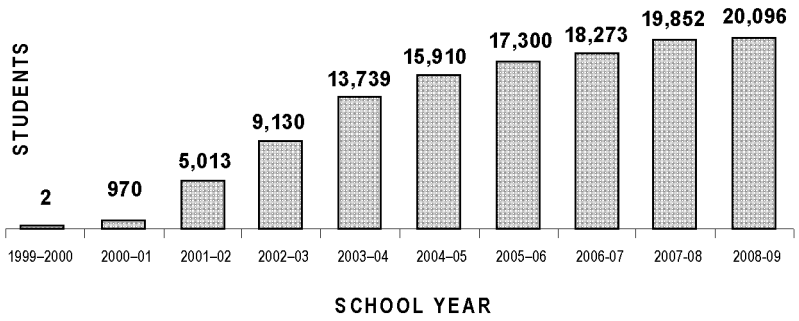
SCHOLARSHIP PROGRAMS

Florida's variety of school choice options includes scholarship programs, giving parents choices so that their children are offered the best opportunities to learn. Florida's three scholarship programs allow parents unprecedented choice among public and private schools. During the current 2008-09 school year, more than 44,000 students are participating in a scholarship program.

John M. McKay Scholarships for Students with Disabilities Program

The John M. McKay Scholarships for Students with Disabilities Program, commonly known as the McKay Scholarship Program, offers parents of students with disabilities the opportunity to make informed choices about the best academic environment for their children. Eligible students include students with disabilities who have an Individual Education Plan (IEP), and who were enrolled and reported for funding by a Florida school district the year prior to applying for a scholarship. Students in military families from other states or countries may also be eligible. Parents have the option of choosing another public school or applying for a scholarship for their child to attend an eligible private school.

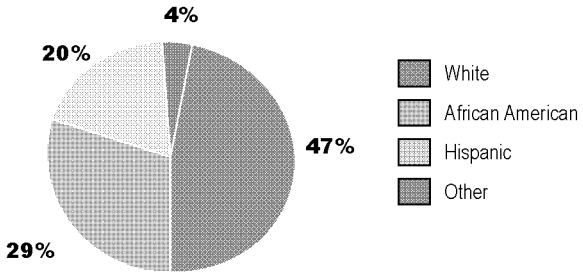
Student Participation in the McKay Scholarship Program



*Note: 2008-09 data based on the McKay Scholarship Program February 2009 Quarterly report.

Almost half of all students participating in the McKay Scholarship Program in 2008-09 are white. African American students represent the second largest student group with 29% participation, followed by Hispanic students with 20% participation.

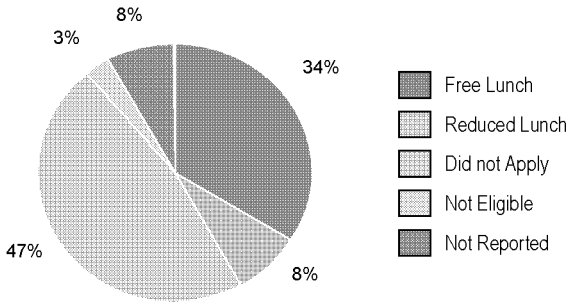
Race/Ethnicity of McKay Scholarship Students, 2008-09



Grade Level Distribution of McKay Scholarship Students2008-09

Grade	Students	Percent
K	333	1.7%
1	567	2.8%
2	833	4.1%
3	1,170	5.8%
4	1,626	8.1%
5	1,746	8.7%
6	2,265	11.3%
7	2,419	12.0%
8	2,331	11.6%
9	1,910	9.5%
10	1,839	9.2%
11	1,606	8.0%
12	1,451	7.2%
Total	**20,096**	**100.0%**

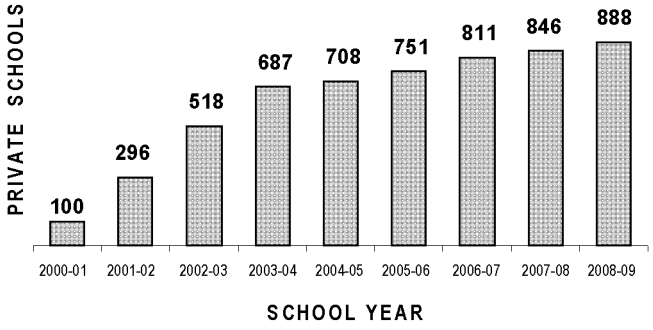
McKay Scholarship Student Eligibility for Free & Reduced-Price Lunch 2008-09



Of students receiving McKay scholarships in 2008-09, 31% are enrolled in kindergarten through grade five, 35% in grades six through eight, and 34% in grades nine through twelve. Slightly over two-thirds (69%) of the McKay scholarship students are male. Forty-two percent (42%) are eligible for the federal free and reduced-price lunch program, an indicator that their families have limited financial resources.

The McKay Scholarship Program offers parent-directed choices and student-directed funding. During the 2007-08 school year, the most recent complete year of funding, $131.3 million was paid to scholarship program participants. Scholarships for individual students enrolled during the 2007-08 school year ranged from $5,160 to $21,769, with an average scholarship amount of $7,295. Currently for the 2008-09 school year, 888 private schools are participating in the McKay Scholarship Program. Private schools participating in the program must document compliance with eligibility requirements specified in law.

Private School Participation in the McKay Scholarship Program is Increasing

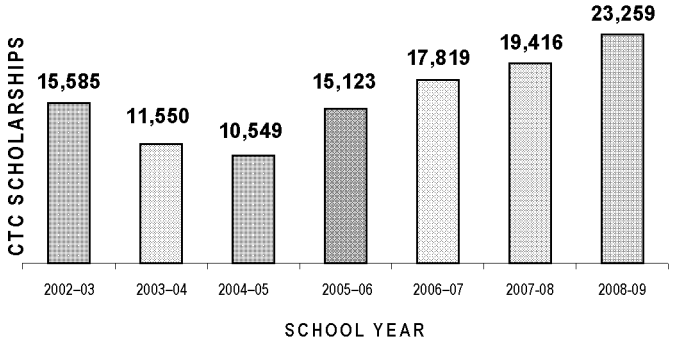


Corporate Tax Credit Scholarship Program

The Corporate Tax Credit Scholarship Program was established to encourage private, voluntary contributions from corporate donors to non-profit scholarship funding organizations that award scholarships to children from low-income families. Under this program, which the state legislature passed in 2001, corporations can receive a dollar-for-dollar tax credit up to 75% of their state income tax liability, and the state may award a maximum of $118 million in credits for the 2008-09 fiscal year. This program expands educational opportunities and school choice for children of families that have limited financial resources.

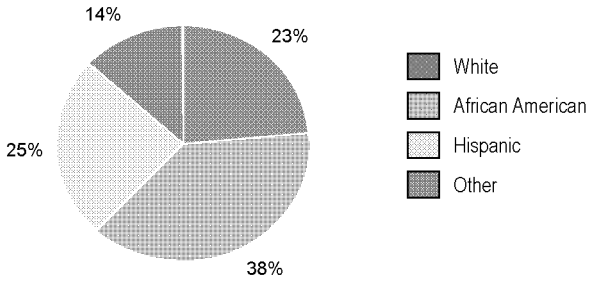
Scholarship payments for over 23,200 students were made in February 2009. Current participation in 2008-09 reflects an eight percent (8%) increase in enrollment from the 2007-08 school year.

Corporate Tax Credit Scholarship Student Participation



*Note: 2008-09 data based on the Corporate Tax Credit Scholarship Program February 2009 Quarterly Report.

Race/Ethnicity of Corporate Tax Credit Scholarship Students 2008-09



Approximately 38% of students participating in the Corporate Tax Credit Scholarship Program in 2008-09 are African American. Hispanic students comprise the next largest population with 25% participation, followed closely by the white population with about 23% participation.

Students are eligible for a scholarship if they qualify for free or reduced lunch and have either attended a public school the previous year, received a scholarship the previous year, or are entering kindergarten or first grade.

Scholarship Funding Organizations and Private Partners

Scholarship Funding Organizations (SFOs) are responsible for the receipt and distribution of corporate funds to eligible and participating private schools in Florida. The scholarships to attend an eligible private school are worth $3,950 or the cost of tuition plus books and transportation, whichever is less. Scholarships to attend a public school in an adjacent district are worth $500 per student for transportation.

Currently for the 2008-09 school year, four SFOs and 988 private schools are participating in the Corporate Tax Credit Scholarship Program.

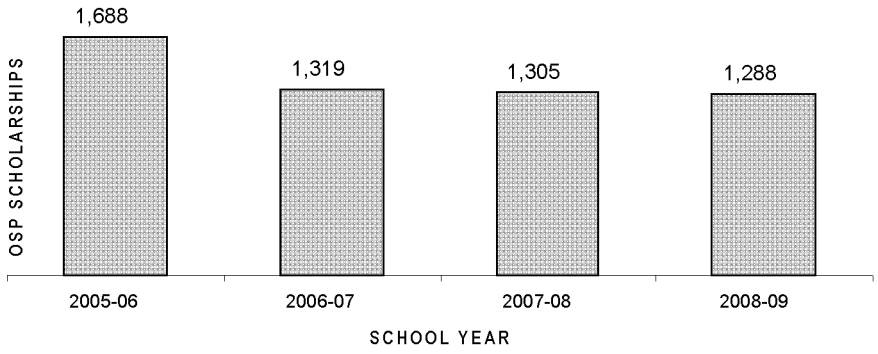
Opportunity Scholarship Program – Public School Option

The Opportunity Scholarship Program (OSP) created under Florida's A+ Education Plan reflects the state's commitment to higher educational standards for students. The Opportunity Scholarship Program allows parents to choose a higher-performing public school if their children attend, or are assigned to attend, a failing Florida public school.

For the purpose of the Opportunity Scholarship Program, a school is considered to be failing if it has received two "F" grades within four consecutive school years. In the year in which the school receives a second "F," eligible students can take advantage of the options under this program. The Opportunity Scholarship becomes available to students at a public school when that school has received two "F" grades within four school years, including the current year.

Historically, the public school option of the Opportunity Scholarship Program has been administered at the school district level. Since the 2005-06 school year, school districts have reported the number of students in their districts participating in the Opportunity Scholarship Program. Of the 1,288* students currently participating in the public option of the Opportunity Scholarship Program for the 2008-09 school year, 94% are enrolled in grades 9-12.

Opportunity Scholarship Program
Public School Option Student Participation

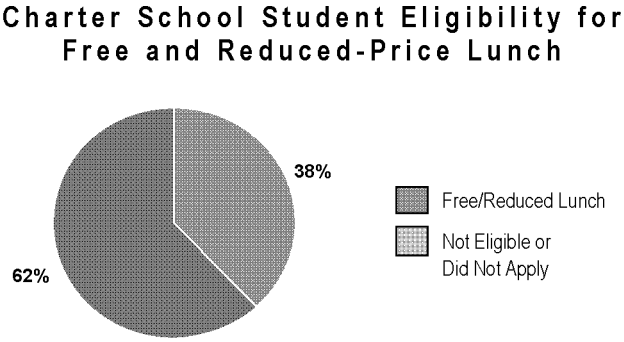


Note: 2008-09 Survey 2 Data as of 1/30/09.

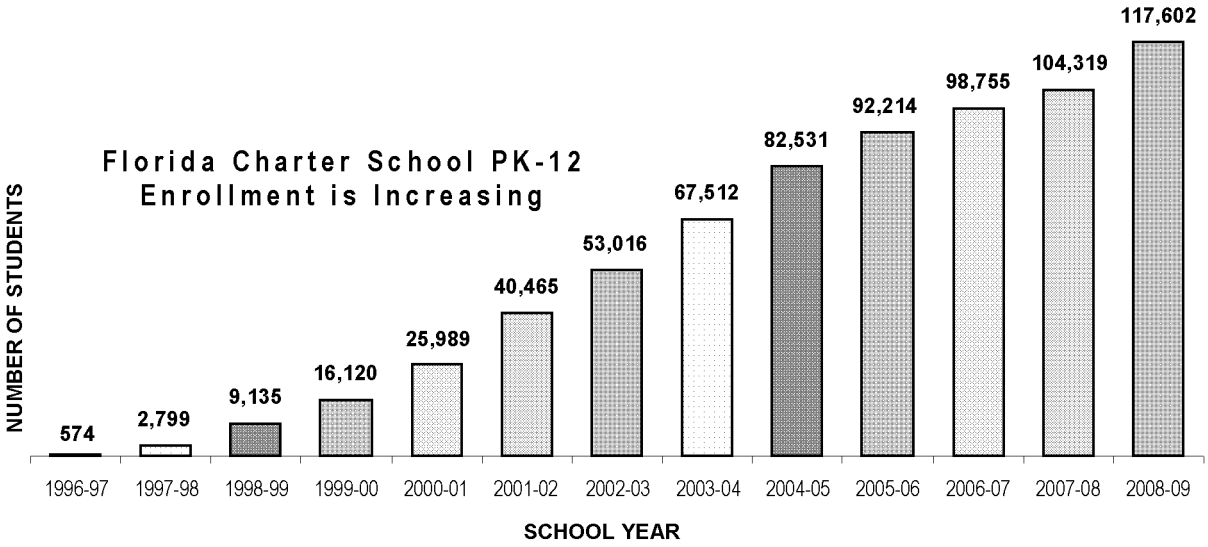
CHARTER SCHOOLS

Charter schools are public schools that are independently operated and committed to academic achievement. Since 1996, charter schools have played a key role in increasing parental options in public education and providing innovative learning opportunities for Florida students. With 389 charter schools currently operating during the 2008-09 school year, Florida has the fourth highest number of charter schools in the nation. From schools specializing in the performing arts to focusing on technical training, Florida's charter schools cover the spectrum of educational needs.

Florida's charter schools strive to provide parents with smaller classes, alternative curriculum and more chances for parental involvement. While authorized and financially supported by local school districts, charter schools are largely free to provide innovative education, and often provide more effective programs and choices to underserved groups of students. Over 117,000 students currently attend charter schools in Florida.

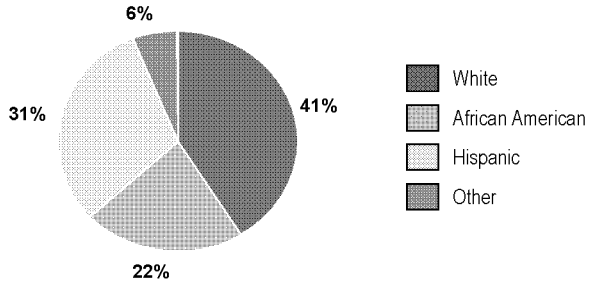


Approximately 38% of students that attended charter schools are eligible for the free and reduced-price lunch program for the 2008-09 school year.



Forty-one percent (41%) of students enrolled in charter schools in the current 2008-09 school year are white. Hispanics represent the next largest population with 31% participation, followed by African Americans with 22% participation.

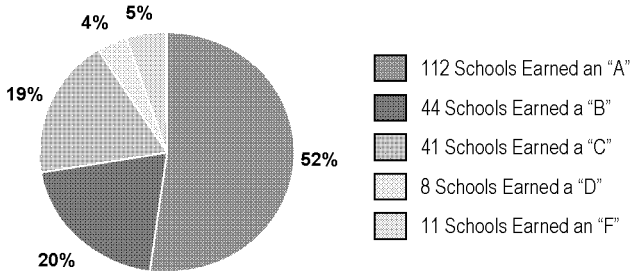
Race/Ethnicity of Charter School Students 2008-09



Charter Schools Measuring Up to the Challenge

In 2007-08, 128 out of 320 (40%) charter schools that were assigned an Adequate Yearly Progress (AYP) status met all the criteria for AYP, as compared to 664 out of 2,985 (22%) traditional public schools that were assigned an AYP status. Seventy-two percent of the 216 operating charter schools that were graded for the 2007-08 school year earned a school performance grade of "A" or "B."

Charter School Performance Grades



Charter Technical Career Centers

The State of Florida has three charter technical career centers with a total enrollment of 8,970 students for the 2007-08 school year. These centers and their sponsors are:

- Advanced Technology College (ATC) – Daytona State College
- First Coast Technical College (FCTC) – St. Johns County School Board
- Lake Technical Center (LTC) – Lake County School Board

The charter technical career centers provide comprehensive and innovative technical education programs, services, and customized training to meet the needs of citizens, business, and industry.

Charter technical career centers aim to develop a competitive workforce using a training and education model reflective of marketplace realities. The career centers offer a continuum of career educational opportunities using a school-to-work, tech-prep, technical, academy, and magnet school model to provide career pathways for lifelong learning and career mobility and to enhance career and technical training.

A charter technical career center may be formed by creating a new school or converting an existing school district or community college program to charter technical status. The center operates under a charter granted by a district school board, a community college board of trustees, or a consortium of one or more district school boards and community college boards of trustees.

VIRTUAL EDUCATION

Florida Virtual School:

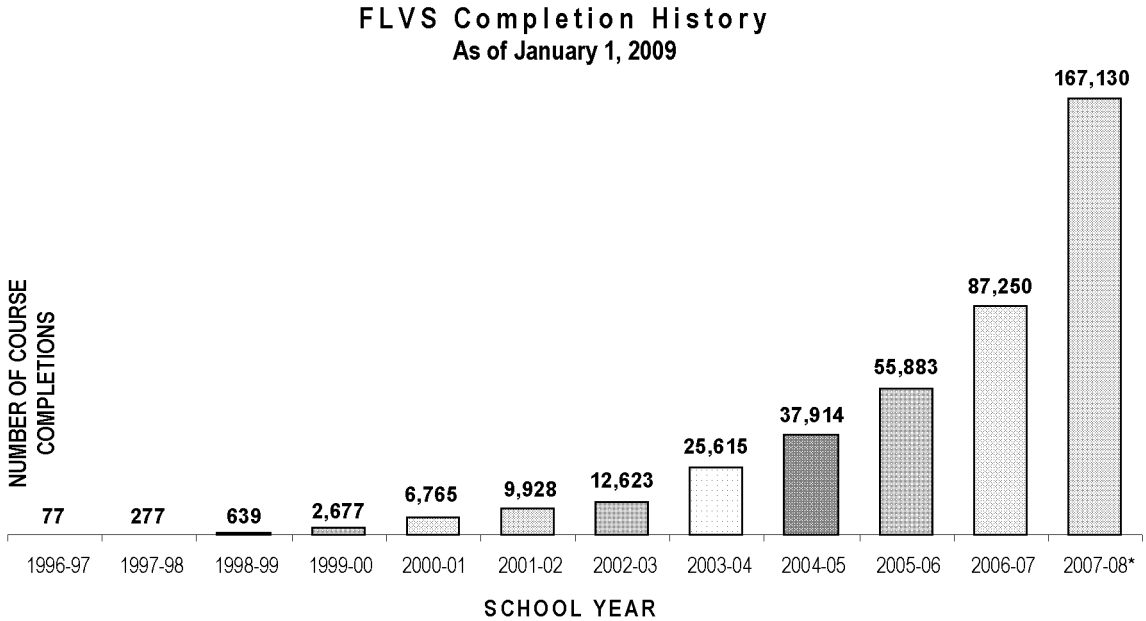
Any Time, Any Place, Any Path, Any Pace

Florida has led the way with groundbreaking legislation that makes online learning possible and fundable. The Florida Legislature initially funded the Florida Virtual School (FLVS) as a grant-based pilot project in 1997, pioneering Florida's first Internet-based, public high school. Since 2001, the FLVS has functioned as a special independent public school district governed by a Board of Trustees appointed by the Governor.

FLVS currently offers a full high school and middle school curriculum with more than 90 online courses which include everything from general and honors courses to 10 Advanced Placement (AP) courses. These courses are free to Florida students, including public, charter, private, and home-educated students.

In 2009, FLVS began developing elementary courses that will be used in both a blended model and individually with students. These courses are under construction and will be available in the near future. FLVS is fully accredited by two major agencies: the Southern Association of Colleges and Schools (SACS) and the Commission on International and Trans-Regional Accreditation.

Parents of FLVS students were surveyed in the spring of 2008 to determine satisfaction with their child's virtual school experience. Over 91% of the parents surveyed rated the overall quality of their child's experience with the FLVS as excellent or good, and 83% believed that their child learned more or the same through virtual school courses than in traditional high school courses. Only 4% thought they learned less. Ninety-two (92%) percent of parents would encourage their child to take other FLVS courses.

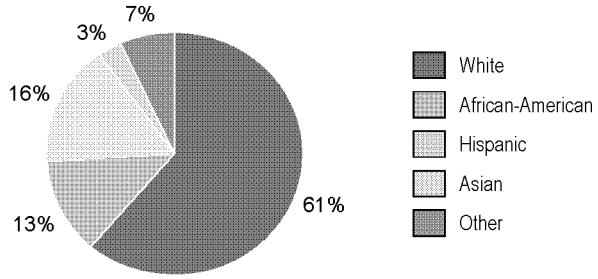


*FLVS completions are measured as half-credit enrollments based on student activations during a 12-month period.

2007-08 completions are based on a 16-month period.

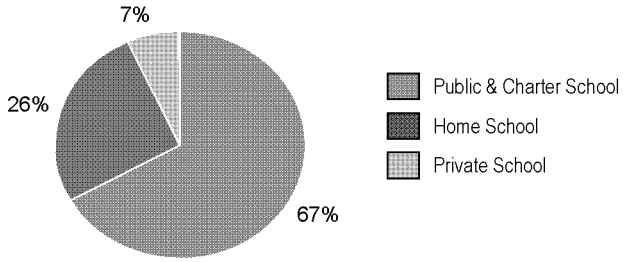
Almost 58% of the students enrolled at FLVS during 2007-08 were female. A majority (61%) of the students enrolled were white. Hispanics represent the next largest minority student population with 16% participation, followed by African-American students with 13% participation.

Race/Ethnicity of FLVS Students2008-09



The majority (67%) of students enrolled in the Florida Virtual School are public school students. Approximately 26% are home-educated students and 7% are enrolled in private schools.

FLVS Student Participation by School Type, 2008-09



K-8 Virtual School Programs:

Combining the Best of Home and Public Education

The K-8 Virtual School Program allows eligible K-8 virtual schools to provide an online education program to full-time students in kindergarten and grades one through eight. Two schools, Florida Connections Academy (FCA) and Florida Virtual Academy (FVA), are currently participating in this state-level program. However, new legislation passed by the 2008 Legislature requires school districts to operate a full-time K-8 virtual instruction program beginning in 2009-10. Therefore, only returning students are able to participate in the state-level programs until the transition to district programs is complete.

School District Virtual Instruction Program

The 2008 Florida Legislature created the School District Virtual Instruction Program which requires school districts to offer a full-time virtual instruction program for students in grades K-8 and a full- or part-time virtual program for grades 9-12 students in Department of Juvenile Justice (DJJ) programs and dropout prevention programs beginning in the 2009-10 school year. School districts may offer these programs beginning with the 2008-09 school year.

FLORIDA'S VOLUNTARY PUBLIC SCHOOL CHOICE PROGRAM

The Florida Department of Education (DOE) was awarded a grant under the 2007 Federal Voluntary Public School Choice (VPSC) Program. This grant assists the DOE and school districts in creating, expanding, and improving public school choice opportunities in Florida. The VPSC Program aims to strengthen the availability, accessibility, and equity of educational options for parents to secure a high-quality education for their children.

One focus of the grant is to expand public school choices through the use of interdistrict agreements in which students from lower performing schools can transfer to higher performing schools across district boundaries.

The DOE is working closely with Hillsborough, Polk, Palm Beach, and Monroe counties to implement transfer agreements for students. The University of South Florida's Alliance for Applied Research in Education and Anthropology (AAREA) will be collecting and analyzing achievement data for students who take part in the interdistrict agreements.

A second focus of the grant is to reach out and educate parents, especially families in low-income areas, about all choice options available to them. To meet this objective, DOE has partnered with NOVA Southeastern University to maintain 8 School Choice Parent Resource Centers (SCPRC) and open an additional 5 Centers over the next 4 years of the grant. The SCPRCs assist families with the paperwork required to transfer their students to higher performing schools.

Additionally they offer information and assistance about all school choice options available to parents. They provide workshops for parents at the Centers and on-site in lower performing schools.

The DOE has created a School Choice Parent Advisory Council (SCPAC) to support the outreach to parents initiative. The SCPAC's mission is to develop and implement strategies so that "All Florida parents will be informed of all educational options and opportunities." Members are appointed by the Commissioner of Education and include parents, school district choice personnel, and representatives of parent organizations such as, but not limited to, Parent Teacher Associations (PTA) and the Florida Parental Information and Resource Center (FLPIRC).

Florida continues to support and promote School Choice, and this grant represents another step in developing high-quality educational choice and in educating parents so they can make the best decision for their children.

Florida School Choice Parent Resource Centers:

- **North Parent Resource Center**
- **Fresh Ministries—Eastside Jacksonville Neighborhood Resource Center**
- **Cuban American National Council**
- **The Resource Room**
- **Gadsden School District/Mobile PRC**
- **South Parent Resource Center**
- **Miami-Dade District Parent Resource Center**
- **Sant la Haitian Neighborhood Center**
- **Compassionate Hearts – Serving Hands, Inc.**
- **Institute for Child & Family Health (ICFH)-All Aboard PRC**

Controlled Open Enrollment

The Florida Legislature recognizes the value of an educational system that provides numerous and meaningful options for students and their parents. In order to promote parental involvement in the school selection process, Florida enacted legislation in 1996 requiring each district school board to develop a plan providing for a controlled open enrollment public education delivery system. These systems allow school districts to make student school assignments using parents' indicated preferential school choice as a significant factor. In requiring each school district to develop an open enrollment choice plan, the Legislature expressed the belief that public school choice will:

- Cultivate constructive competition
- Serve as an impetus for academic improvement
- Foster greater accountability within the school system

Each district school board may offer controlled open enrollment within the public schools in addition to the existing choice programs such as magnet schools, alternative schools, special programs, advanced placement, and dual enrollment. Controlled open enrollment emphasizes the rights for families to choose among existing public schools. Instead of being assigned to a public school by a school district based on attendance zones, parents may choose a school from anywhere within the district or, if not geographically feasible, from within established zones or boundaries within the district.

To ensure that school districts comply with legislative requirements and to evaluate the voluntary implementation of controlled open enrollment throughout the state, the Department of Education created a reporting format that requires school districts to collect and report data regarding educational choice options. School districts report student data for educational choice each August via the state's Automated Student Information Data Base. As reported for the 2007-08 school year, over 323,000 students in 47 of the state's 67 school districts, or about 12% of the total number of students enrolled in the state, attended a Florida public school through the districts' controlled open enrollment program.

Other Public School Options

Various options are used across Florida to respond to the unique learning needs of every school district's students and communities. The most common form of public school choice is offering a variety of courses and electives to meet graduation requirements for high school and allowing students to select the courses that will best meet their learning needs. Among the other choice options being implemented by districts used to meet student and parental needs are magnet schools, career and professional academies, and intensive nationally and internationally recognized instructional programs.

Magnet Schools

Magnet schools are public schools with a particular theme or academic focus on topics such as medical, criminal justice, science and mathematics, technology, performing arts, International Baccalaureate, and foreign languages. Magnet schools provide parents and students with the option of choosing a school that matches a student's interests. They are designed to attract a variety of students and sometimes enroll students from different districts. Magnet schools offer students specialized programs and create innovative learning approaches in a diverse environment. More than 345,000 students participated in over 340 magnet schools or magnet programs in 24 Florida school districts during the 2007-08 school year.

Career and Professional Academies

Career and Professional Academies are small, personalized learning communities within a high school that select a subset of students and teachers for a two-, three-, or four-year span. Students enter a career and professional academy through a voluntary process. They must apply and be accepted with parental knowledge and support.

- A career and professional academy includes the following essential elements:
- A small learning community
- A rigorous academic curriculum with a career theme
- Partnerships with employers, the community, and higher education

By design, these three central elements of a career and professional academy lead to a school that is rigorous, relevant, and relational. Academies draw on the interest students have in learning about some feature of the world of work and integrate career-specific curriculum and instruction into core academic curriculum. Over 240 career and professional academies operate in 38 Florida school districts with a focus on areas including hospitality and tourism, health science, science and technology, information technology, and architecture and construction.

Dual Enrollment

Dual enrollment allows eligible high school students to enroll in postsecondary courses. They earn credit toward high school graduation and at the same time earn credit toward a college degree or technical certificate. All 28 public community and state colleges and some state universities in Florida participate in dual enrollment. Students are permitted to take dual enrollment courses on a part-time basis during school hours, after school, or during the summer term. Dual enrollment students do not have to pay registration, matriculation, or laboratory fees.

Advanced Placement (AP) Program

The College Board's Advanced Placement (AP) Program is a nationwide program consisting of more than 30 college-level courses and exams offered at participating high schools. Subjects range from art to statistics. Students who earn a qualifying grade of 3 or above on an AP exam can earn college credit or advanced placement or both, depending on the college or university. Students in Florida's public secondary schools enrolled in AP courses do not have to pay to take the exams.

Advanced International Certificate of Education (AICE) Program

The Advanced International Certificate of Education (AICE) Program is an international curriculum and examination program modeled on the British pre-college curriculum and "A-Level" exams. Florida's public community colleges and universities provide college credit for successfully passed exams. Students in Florida's public secondary schools enrolled in AICE courses do not have to pay to take the exams.

The International Baccalaureate (IB) Diploma Program

The International Baccalaureate (IB) Diploma Program is a rigorous pre-university course of study leading to internationally standardized tests. The program's comprehensive two-year curriculum allows its graduates to fulfill requirements of many different nations' education systems. Students completing IB courses and exams are eligible for college credit. The award of credit is based on scores achieved on IB exams. Students can earn up to 30 postsecondary semester credits by participating in this program at the high school level. Approximately 40 Florida high schools participate in the IB program. Students in Florida's public secondary schools enrolled in IB courses do not have to pay to take the exams.

NO CHILD LEFT BEHIND SCHOOL CHOICE

The federal No Child Left Behind (NCLB) Act of 2001 is designed to ensure that children have a fair, equal, and significant opportunity to obtain a high-quality education. The legislation provides federal resources for students to reach proficiency levels on challenging state academic standards and assessment. Under NCLB, when schools do not meet state targets for improving the achievement of all students, parents are provided options for meeting their child's learning needs.

Parents whose children are enrolled in Title I schools that are identified in need of improvement, corrective action, or restructuring have the opportunity to transfer their children to a higher-performing public school. If they do so, the local school district must provide transportation.

Parents of students enrolled in schools in need of improvement, corrective action, or restructuring may also have the opportunity for their children to receive supplemental educational services (SES). These services include tutoring and other academic enrichment services provided outside the regular school day and designed to enable children from low-income families to reach academic proficiency. SES tutoring offers eligible students the opportunity to participate in high-quality research-based educational programs in subject areas such as reading, language arts, and mathematics. Eligible families choose an SES provider from a state-approved list, and school districts pay for the tutoring services using federal funds.

Public school choice is a critical component of NCLB that can provide students in low-performing Title I schools with the opportunity to obtain a high-quality education. When students are provided quality educational options, and when parents receive information to make informed choices among those options, public school choice can increase both equity and quality in education.

Public School Choice with Transportation and Supplemental Educational Services

	Title I Schools in Florida	Public School Choice with Transportation	Supplemental Educational Services
2004-05	**1,426**	• Approximately 900 Title I schools did not make Adequate Yearly Progress (AYP) for two years and were required to offer parents public school choice with transportation.	• 33 Title I schools did not make AYP for three years and were required to offer SES.
2005-06	**1,386**	• Approximately 300 Title I schools did not make AYP for two years and were required to offer parents public school choice with transportation.	• Approximately 700 of Title I schools did not make AYP for three or more consecutive years and were required to offer SES.
2006-07	**1,382**	• 1,001 Title I schools did not make AYP for two or more years and were required to offer parents public school choice with transportation.	• 872 Title I schools did not make AYP for three or more consecutive years and were required to offer SES. • School districts reported that approximately 70,000 students participated in SES.
2007-08	**1,365**	• Approximately 990 Title I schools did not make (AYP) for two years and were required to offer parents public school choice with transportation.	• 892 Title I schools did not make AYP for three or more consecutive years and were required to offer SES. • School district reported that approximately 70,000 students participated in SES.

HOME EDUCATION

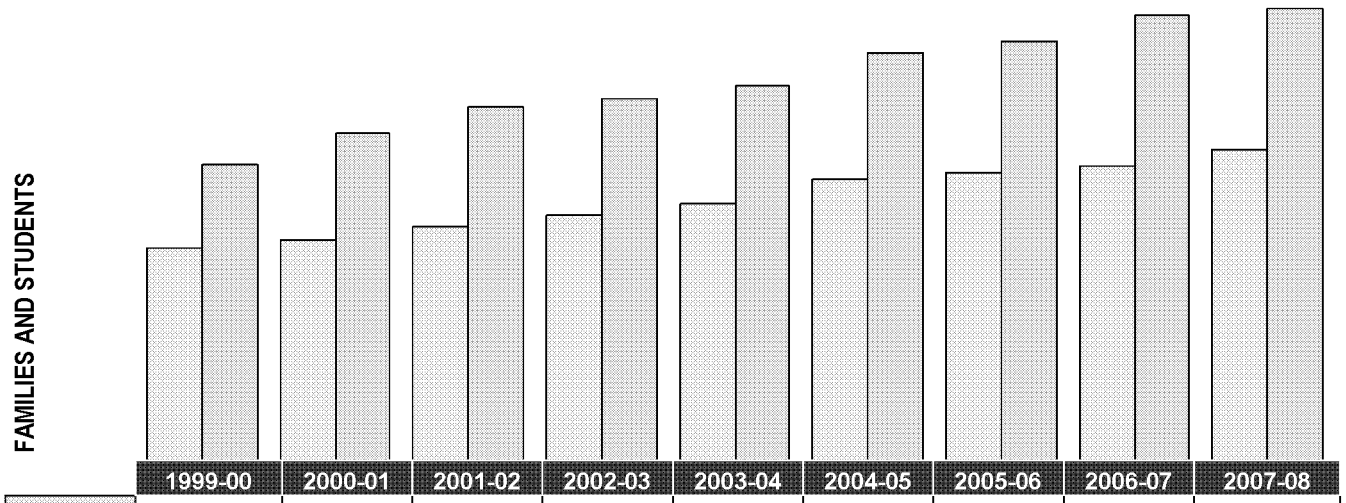
Florida is a long-time supporter of home education and the number of families choosing this education option shows steady growth. Established as an educational choice by the Florida Legislature in 1985, home education programs give parents the freedom to nurture their child's individual learning style, creativity and intellect and allows students the opportunity to learn and explore at their own pace, in any location or at any time of the day. More than 56,600 students in 39,100 Florida families, representing every school district and county, were registered in home education programs in the 2007-08 school year.

Florida law does not require a particular educational background for parents or standard curricula for home-educated students. Parents home educating their children are able to customize the curriculum to the needs of each child.

However, a portfolio of records and materials showing student work must be maintained for two years and made available to the school district if requested in writing. There is no attendance requirement for home education students, as the learning environment is not restricted to a regular classroom setting. The law allows parents the flexibility to choose from five annual evaluation methods, enabling them to select the best measure of learning for each student.

Parents register a home education program with their school district, providing the names, addresses and birthdates of all children who are enrolled in a home education program. Home education students may participate in dual enrollment and are eligible for Florida Bright Futures Scholarships. Children of all ages are home educated across the state, and some enter college straight from their courses of study at home.

Growth in Home Education Programs 1999-2008

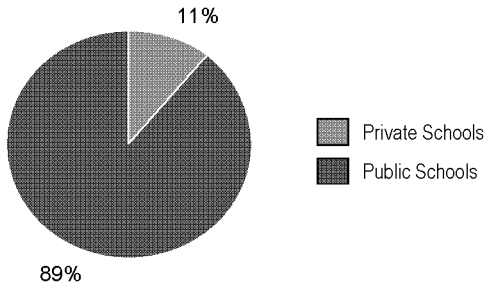


	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Families	26,656	27,792	29,417	30,892	32,166	35,377	36,149	36,939	39,100
Students	37,196	41,128	44,460	45,333	47,151	51,110	52,613	55,822	56,650

PRIVATE SCHOOLS

More than 335,200 students were enrolled in 2,185 private schools in Florida during the 2007-08 school year. This represents approximately 11.2% of the state's total student enrollment in Prekindergarten programs through grade 12.

PK-12 Public and PrivateSchool Enrollment 2007-08



Each private school has a stated purpose and philosophy unique to that school. Some private schools place an emphasis on college preparation, some are vocational, and others seek to meet the needs of children with particular learning styles. These schools operate with limited regulation by the state, but Florida law does require private schools to meet certain standards in regards to health, safety and sanitation.

Each private school is required by Florida law to complete an annual survey that is maintained by the Department of Education as an information database for the public, governmental agencies, and other interested parties. The state is not required to verify the accuracy of the information submitted and inclusion in the database does not imply state accreditation or approval. The Department of Education and the state's private school organizations work together in serving Florida's diverse student population; the relationship is professional, rather than regulatory.

CONCLUSION

Florida's school choice programs provide unique flexibility for parents, giving families greater choice in educational opportunities. Studies show that school choice programs can increase student achievement and parental satisfaction. Diversity in school structure and programs is crucial to Florida's goal of bringing all students to high levels of academic achievement. Constructive competition and greater accountability provide an incentive for all schools to improve.

While Florida leads the nation in school choice options, there is still much to be done. The highest priority is to improve the quality of all choice programs while educating and empowering parents to make the best educational choices for their children.

School Choice Benefits for Families and Students

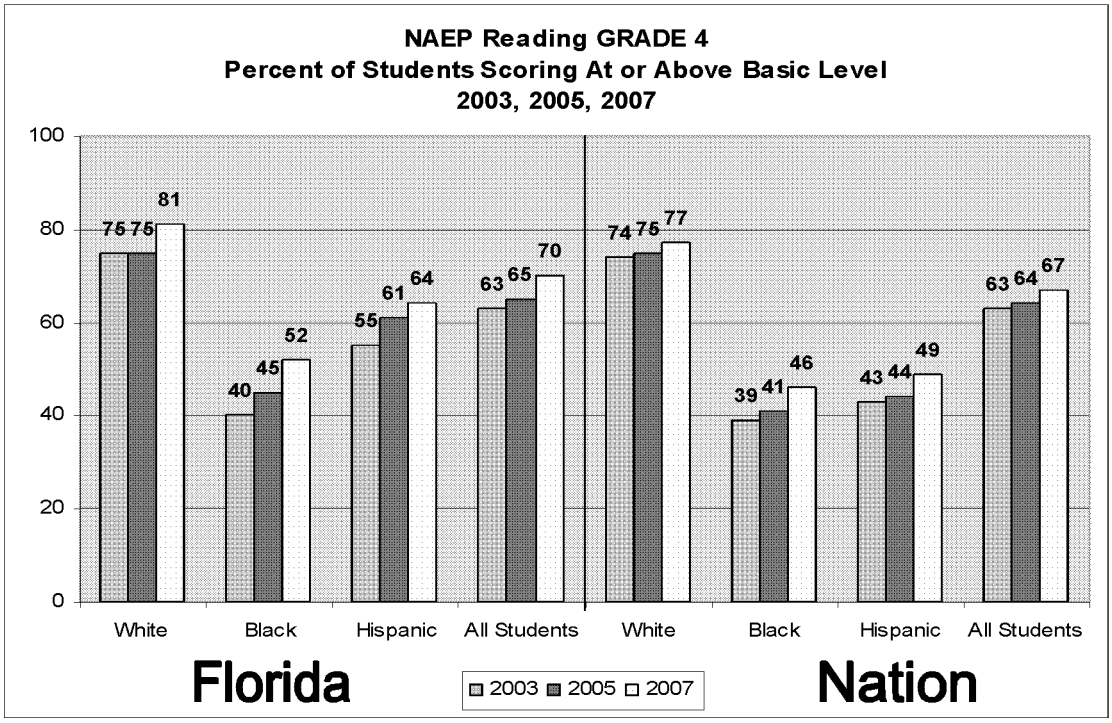
- **Promotes increased student achievement**
- **Increases parental involvement**
- **Promotes school improvement through constructive competition**
- **Provides greater accountability within the school system**

Florida Department of Education
Eric J. Smith, Commissioner
http://www.fldoe.org

SCHOOL CHOICE
Florida Department of Education

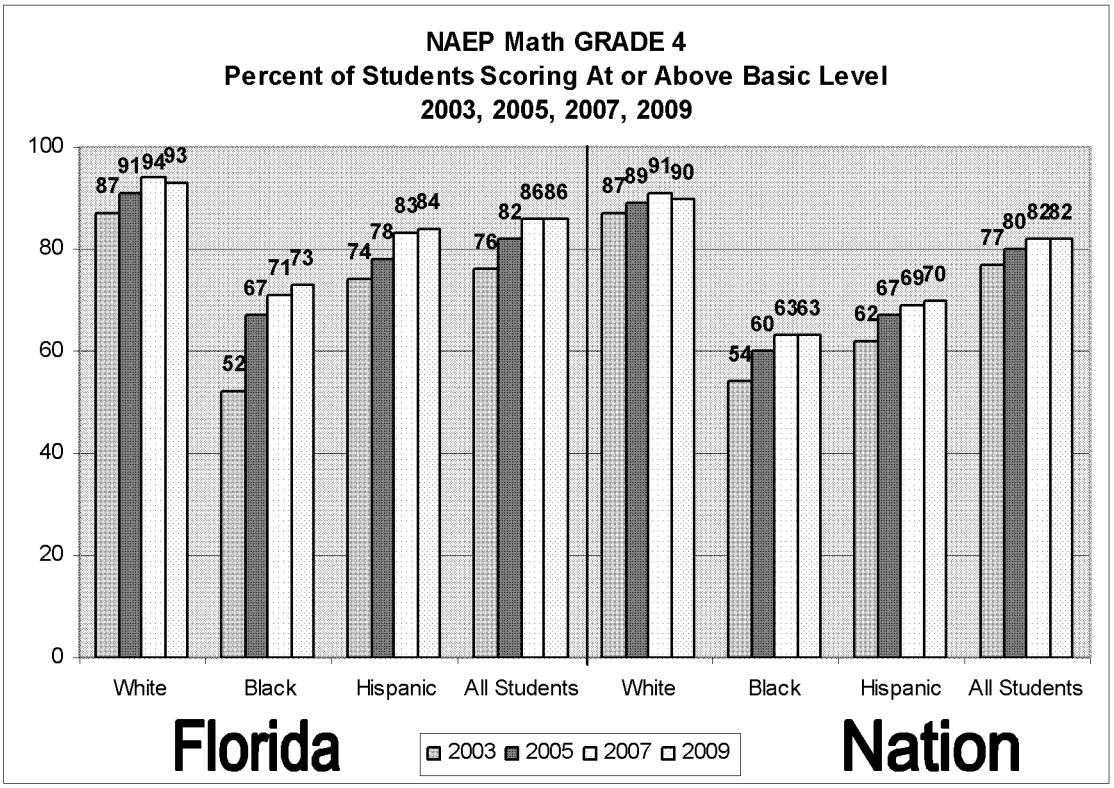
Office of Independent Education and Parental Choice
325 West Gaines Street, Suite 522
Tallahassee, FL 32399-0400
850/245-0502
800-447-1636 Toll-Free Hotline
www.floridaschoolchoice.org

A-10: NAEP HISTORIC SUBGROUP DETAIL



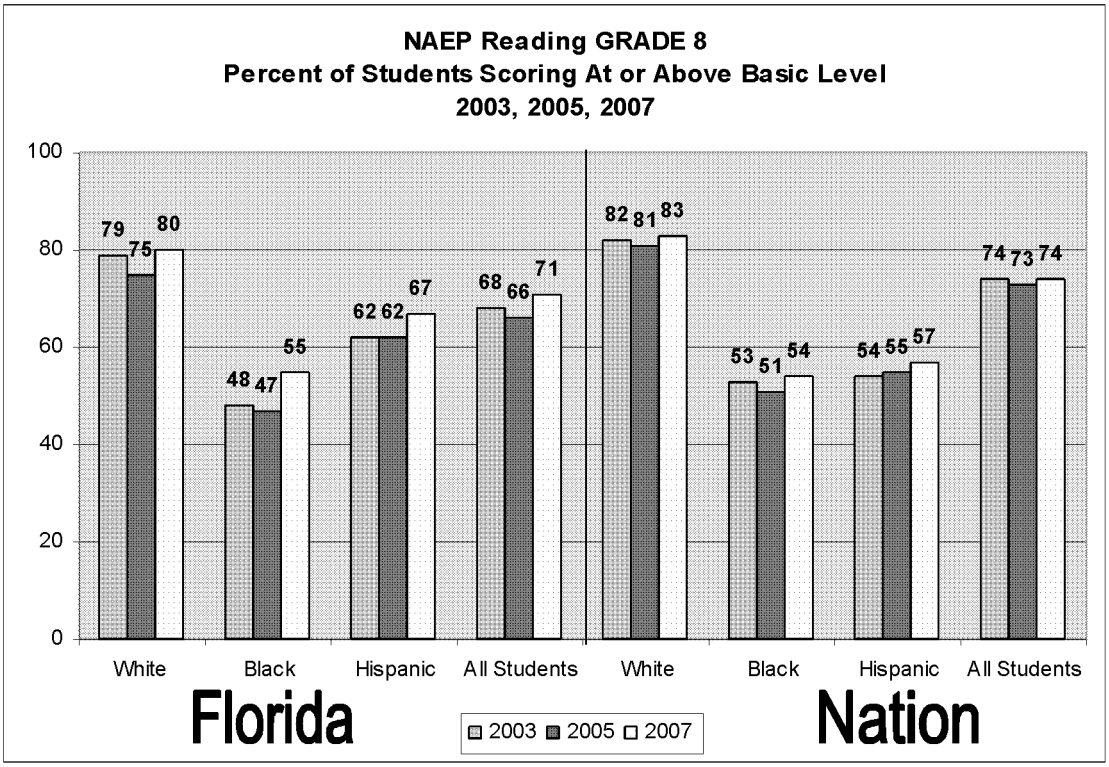
NAEP GRADE 4 READING									
	All	**White**	**Black**	**Hispanic**	**SD**	**FRL**	**ELL**	**Female**	**Male**
2003	63	75	40	55	29	49	43	67	58
2005	65	75	45	61	38	53	32	67	62
2007	70	81	52	64	38	59	38	75	66

Source: http://nationsreportcard.gov



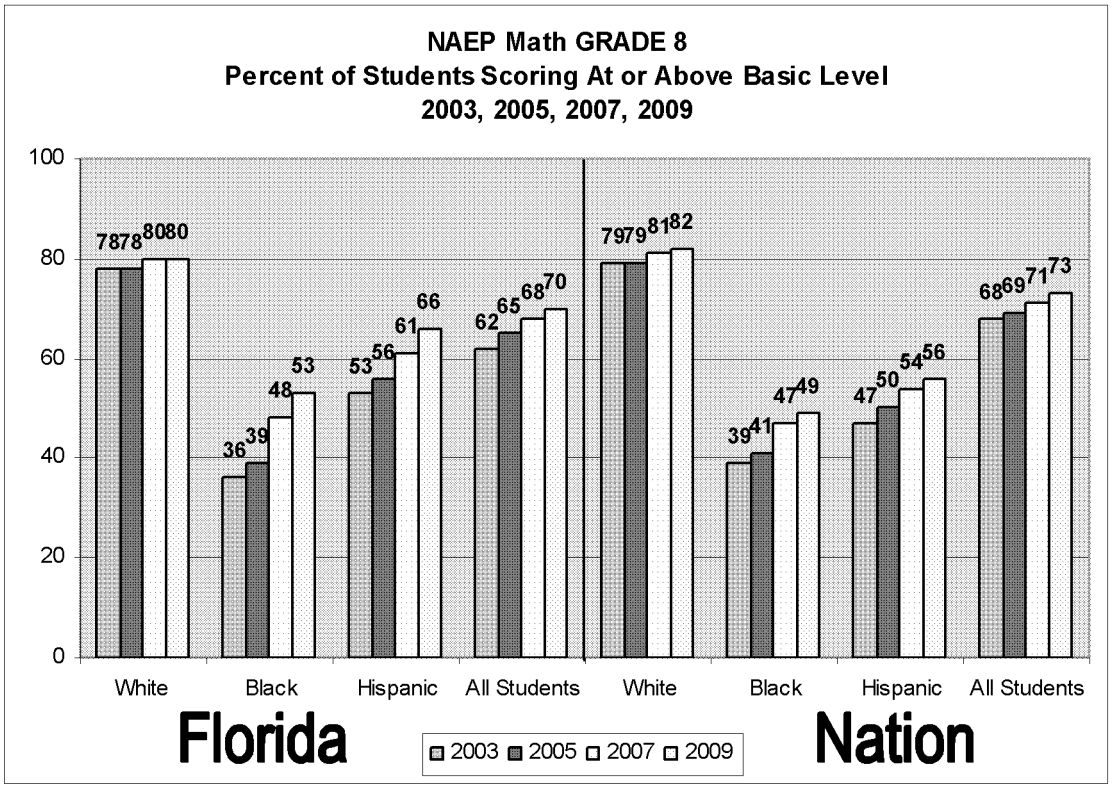
NAEP GRADE 4 MATH									
	All	**White**	**Black**	**Hispanic**	**SD**	**FRL**	**ELL**	**Female**	**Male**
2003	76	87	52	74	50	63	62	75	76
2005	82	91	67	78	67	74	57	81	83
2007	86	94	71	83	63	79	64	86	87
2009	86	93	73	84	72	80	69	86	86

Source: http://nationsreportcard.gov



NAEP GRADE 8 READING									
	All	**White**	**Black**	**Hispanic**	**SD**	**FRL**	**ELL**	**Female**	**Male**
2003	68	79	48	62	29	55	34	74	61
2005	66	75	47	62	34	56	27	73	59
2007	71	80	54	67	36	61	40	78	66

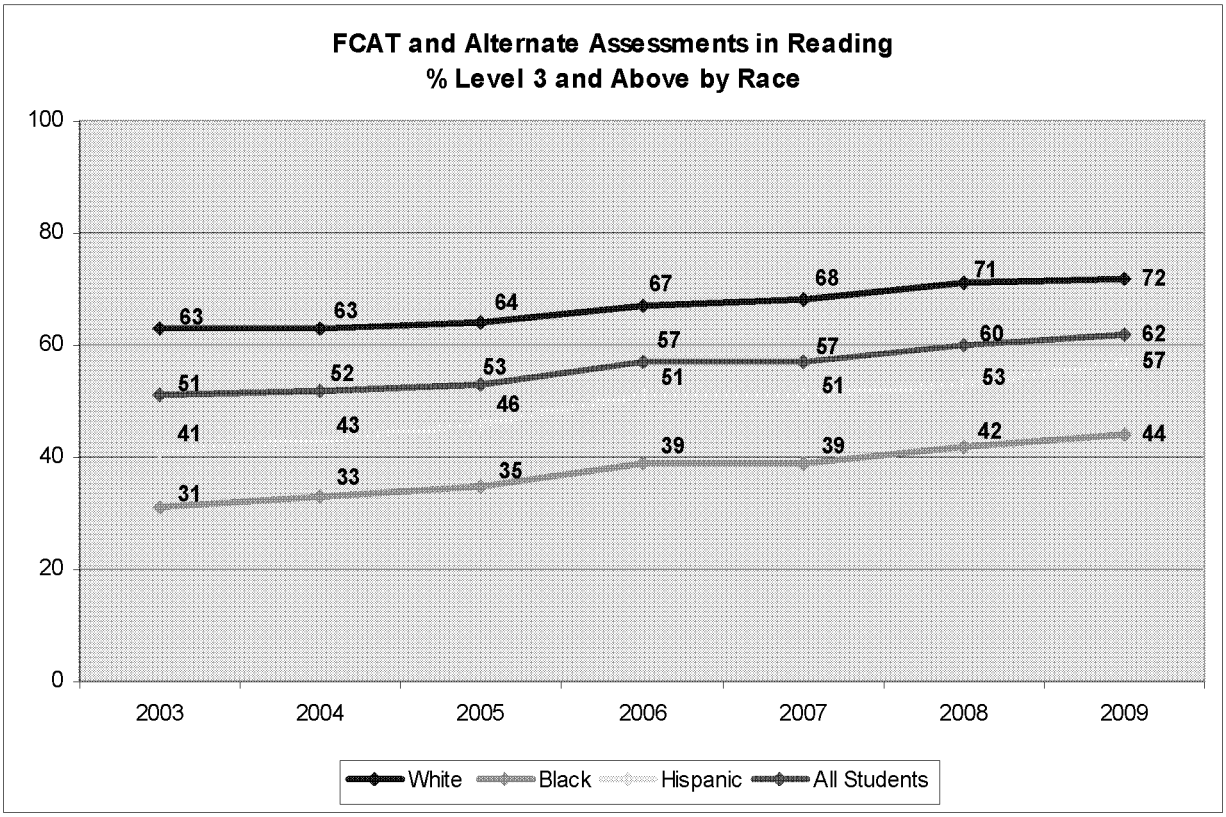
Source: http://nationsreportcard.gov



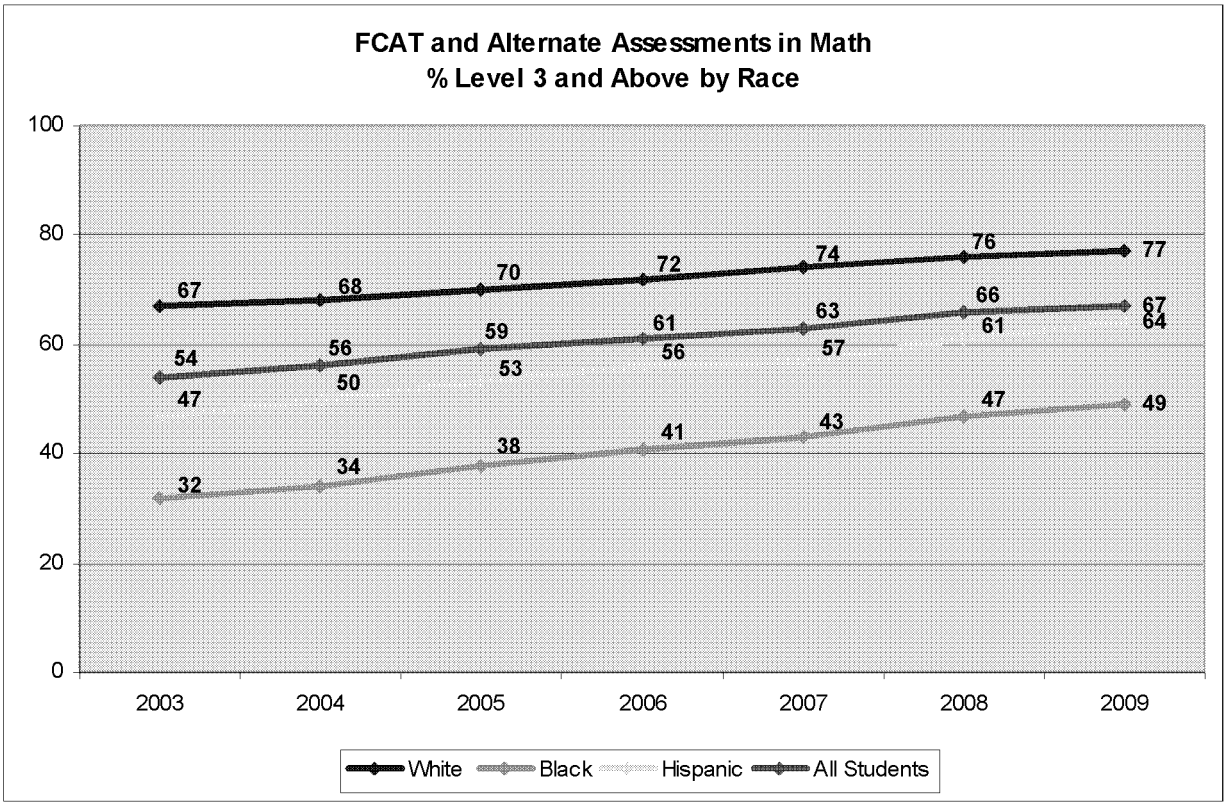
NAEP GRADE 8 MATH									
	All	**White**	**Black**	**Hispanic**	**SD**	**FRL**	**ELL**	**Female**	**Male**
2003	62	78	36	53	24	45	22	59	64
2005	65	78	39	56	37	50	30	63	67
2007	68	80	48	61	34	55	28	68	68
2009	70	80	53	66	39	59	30	69	71

Source: http://nationsreportcard.gov

A-11: FCAT HISTORIC SUBGROUP DETAIL



FCAT and Alternate Assessments in Reading % Level 3 and Above								
	2003	2004	2005	2006	2007	2008	2009	% Change from 2003 to 2009
All	51	52	53	57	57	60	62	11
White	63	63	64	67	68	71	72	9
Black	31	33	35	39	39	42	44	13
Hispanic	41	43	46	51	51	53	57	16
Asian	64	65	68	71	72	75	77	13
Am. Indian	55	55	58	61	62	64	66	11
Multiracial	64	65	65	67	67	68	70	6
SWD*	24	26	28	30	31	34	36	12
FRL	38	40	42	46	46	48	52	14
ELL**	15	30	32	36	35	37	42	27
Migrant	24	27	30	33	34	36	40	16
Female	53	54	55	60	60	62	64	11
Male	49	50	51	54	55	58	59	10



FCAT and Alternate Assessments in Math % Level 3 and Above								
	2003	2004	2005	2006	2007	2008	2009	% Change from 2003 to 2009
All	54	56	59	61	63	66	67	13
White	67	68	70	72	74	76	77	10
Black	32	34	38	41	43	47	49	17
Hispanic	47	50	53	56	57	61	64	17
Asian	76	78	81	82	83	85	86	10
Am. Indian	59	61	63	66	68	71	72	13
Multiracial	62	64	65	67	68	70	71	9
SWD*	25	27	30	32	33	38	39	14
FRL	39	42	46	48	50	54	57	18
ELL**	26	38	40	43	44	47	51	25
Migrant	31	35	39	42	44	49	53	22
Female	54	56	59	61	62	66	67	13
Male	55	57	59	62	63	66	68	13

A-12: STATE ASSESSMENT OF SWD AND ELL; EXCEPTION FROM NAEP

Grade 4	Participation Rate for Students with Disabilities	Participation Rates for English Language Learners
Math 2003	88	83
Math 2005	88	83
Math 2007	87	80
Math 2009	90	95
Reading 2003	81	77
Reading 2005	75	70
Reading 2007	75	59

Grade 8	Participation Rate for Students with Disabilities	Participation Rates for English Language Learners
Math 2003	87	78
Math 2005	85	80
Math 2007	83	79
Math 2009	87	91
Reading 2003	75	69
Reading 2005	78	61
Reading 2007	81	47

NAEP 2010 Operational (Paper-Pencil) State-Specific English Language Learners (ELL) Guidelines Summary – Florida

The Florida Department of Education expects that most English language learners (ELL) will be included on the National Assessment of Educational Progress (NAEP) as follows:

- All English language learners who participate in the FCAT with or without accommodations should participate in NAEP.
- All English language learners who participate in the FCAT should participate in NAEP with appropriate accommodations.
- Only English language learners who have been enrolled in U.S. schools for less than 12 months may be excluded from any NAEP assessments. All other English language learners should participate in NAEP using appropriate accommodations.

Since some students may require accommodations in order to access the assessment and to better demonstrate their knowledge and skills, NAEP offers most of the accommodations that Florida allows on the state assessments. A student's English Language Proficiency Plan should not require revisions for the student to participate in NAEP. The following table should be used to determine allowable accommodations for English language learners in Florida. If an accommodation is not listed, please check with your District Assessment Coordinator to see if the accommodation can be provided on NAEP.

Several accommodations provided on the FCAT are not necessary for NAEP because of how it is administered. For example:

- Writes answers in test booklet: On NAEP, all students write responses in the assessment booklets, not on separate answer documents.
- Takes assessment over multiple days: NAEP is much shorter than the state assessments, so multiple-day testing is not offered. Students take two 25-minute subject matter blocks and answer survey questions about their educational experiences.

Please keep in mind that NAEP does not produce results for individual students or schools, like the FCAT. All results are summarized only at the national level. In other words, the NAEP assessments do not impose consequences for the student or the school, and are instead intended purely to provide a picture of educational performance and progress.

Accommodation	Subject	Accommodation Description	Allowed in State

Extended time	Geography, U.S. History, Civics, Writing, and Mathematics	This accommodation requires that students be given extra time to complete the assessment.	Yes
Small group	Geography, U.S. History, Civics, Writing, and Mathematics	Generally, a small group session includes no more than five students. A student can be assigned to a small group session because he/she requires one, or because one or more of the accommodations he/she typically requires must be administered in a separate session to minimize distractions to other students in the regular session.	Yes
Test items read aloud in English - occasional	Geography, U.S. History, Civics, Writing, and Mathematics	• For this accommodation, students may request to have words, phrases, or sentences read aloud to them in English.	No
Test items read aloud in English – most or all	Geography, U.S. History, Civics, Writing, and Mathematics	For this accommodation, students may request to have most or all of the assessment booklet read aloud to them in English.	No

Accommodation	Subject	Accommodation Description	Allowed in State
Breaks during test	Geography, U.S. History, Civics, Writing, and Mathematics	This accommodation requires that the student be allowed to take breaks as requested or at predetermined intervals during the assessment. This also could mean that the student is allowed to take the assessment in more than one sitting during a single day.	Yes
Bilingual dictionary without definition in any language	Geography, U.S. History, Civics, Writing, and Mathematics	This is a non-electronic bilingual dictionary provided by the school in any language that contains English translations of words but does not contain definitions. It is sometimes referred to as a "word-for-word" dictionary, "word-to-word translation dictionary," or a "bilingual word list."	Yes
General and/or subject specific directions read aloud in English	Geography, U.S. History, Civics, Writing, and Mathematics	For this accommodation students have the general directions (same for all students) and/or the subject-specific directions read aloud, repeated, or reworded in any way, in English, so that students understand what to do.	Yes
One-on-one	Geography, U.S. History, Civics, Writing, and Mathematics	This accommodation requires that a student is assessed individually in an area free of distractions.	Yes
Preferential seating, light, furniture	Geography, U.S. History, Civics, Writing, and Mathematics	This accommodation requires that a student sit in a designated area for the assessment, such as away from other students to limit distractions; a location where there is access to special equipment; or close to the front of the room so that a student can see or hear more easily. It may also include special lighting and furniture, such as a study carrel used by the student.	Yes

School staff administers	Geography, U.S. History, Civics, Writing, and Mathematics	This accommodation requires that a school staff member familiar to the student administer the session.	Yes
General directions read aloud in Spanish	Geography, U.S. History, Civics, Writing, and Mathematics	This accommodation requires that the general session script instructions be read aloud in Spanish. Session script directions are the same for all students.	Yes
Test items read aloud in Spanish	• Geography, U.S. History, Civics, Writing, and Mathematics	• For this accommodation, students may request to have words, phrases, or ~~sentences~~ read aloud to them in Spanish. This requires the student to use the bilingual Spanish/English booklet. Students who need subject-specific directions read aloud in Spanish will need this accommodation.	Yes, Words and phrases only
Spanish/English version of the test	Geography, U.S. History, Civics, Writing, and Mathematics	NAEP has bilingual Spanish/English booklets available for students who require them. When a bilingual booklet is open, one page has the directions and questions in Spanish, and the facing page will have the same directions and questions in English. Because of the size, the booklets are printed in a set of two. Students may mark their answers on either page and in either language.	No

NAEP 2010 Operational (Paper-Pencil) State-Specific Students with Disabilities (SD) Guidelines Summary – Florida

The **Florida Department of Education** expects that most students with disabilities (SD) and students on a Section 504 Plan will be included in the National Assessment of Educational Progress (NAEP) as follows:

- All students on a Section 504 Plan should participate in NAEP with or without appropriate accommodations.
- All students with disabilities that participate in the FCAT with or without accommodations should participate in NAEP.
- Most students with disabilities that participate in the FCAT should participate in NAEP with appropriate accommodations.
- Only students with disabilities that participate in the Florida Academic Alternate Portfolio may be excluded from any NAEP assessment.

Since some students may require accommodations in order to access the assessment and to better demonstrate their knowledge and skills, NAEP offers most of the accommodations that FCAT allows on the state assessments. A student's Individualized Education Program (IEP) or Section 504 Plan should not require revisions for the student to participate in NAEP. The following table should be used to determine allowable accommodations for students with disabilities in **Florida**. If an accommodation is not listed, please check with your District Assessment Coordinator to see if the accommodation can be provided on NAEP.

Several accommodations provided on the FCAT are not necessary for NAEP because of how it is administered. For example:

- Writes answers in test booklet: On NAEP, all students write responses in the assessment booklets, not on separate answer documents.
- Takes assessment over multiple days: NAEP is much shorter than the state assessments, so multiple-day testing is not offered. Students take two 25-minute subject matter blocks and answer survey questions about their educational experiences.

Please keep in mind that NAEP does not produce results for individual students or schools, like the FCAT. All results are summarized only at the national level. In other words, the NAEP assessments do not impose consequences for the student or the school, and are instead intended purely to provide a picture of educational performance and progress.

Accommodation	Subject	Accommodation Description	Allowed in State
Extended time	Geography, U.S. History, Civics, Writing, and Mathematics	This accommodation requires that students be given extra time to complete the assessment.	Yes
Small group	Geography, U.S. History, Civics, Writing, and Mathematics	Generally, a small group session includes no more than five students. A student can be assigned to a small group session because he/she requires one, or because one or more of the accommodations he/she typically requires must be administered in a separate session to minimize distractions to other students in the regular session.	Yes
Test items read aloud in English - occasional	Geography, U.S. History, Civics, Writing, and Mathematics	• For this accommodation, students may request to have words, phrases, or sentences read aloud to them in English.	Yes, but not for Reading
Test items read aloud in English – most or all	Geography, U.S. History, Civics, Writing, and Mathematics	For this accommodation, students may request to have most or all of the assessment booklet read aloud to them in English.	Yes, but not for Reading
Breaks during test	Geography, U.S. History, Civics, Writing, and Mathematics	This accommodation requires that the student be allowed to take breaks as requested or at predetermined intervals during the assessment. This also could mean that the student is allowed to take the assessment in more than one sitting during a single day.	Yes
Test items signed	Geography, U.S. History, Civics, Writing, and Mathematics	This accommodation requires that a qualified sign language interpreter at the school sign some or all of the test questions and answer choices for the student.	Yes, but not for Reading

Accommodation	Subject	Accommodation Description	Allowed in State
Responds in sign language	Geography, U.S. History, Civics, and Mathematics	This accommodation requires that students sign their responses to a qualified sign language interpreter provided by the school. The interpreter records the student's answers in the assessment booklet.	Yes
Presentation and response in Braille	Geography, U.S. History, Civics, Writing, and Mathematics	Presentation is a Braille version of the booklet. Response requires that a visually impaired student record his/her answers using a Braille output devise, a slate and stylus, an electronic Braille note taker provided by the school, or uses a scribe to record answers.	Yes
Large-print version of test	Geography, U.S. History, Civics, Writing, and Mathematics	NAEP provides large-print booklets to students who are visually impaired. These are assessment booklets that have been enlarged to 129 percent.	Yes
Magnification equipment	Geography, U.S. History, Civics, Writing, and Mathematics	This is a lens or system provided by the school that enhances visual function. Magnification devices include eyeglass-mounted magnifiers, free-standing or hand-held magnifiers, enlarged computer monitors, or computers with screen enlargement programs. Some students use closed-circuit television to enlarge print and display printed material with various image enhancements on a screen.	Yes
Responds orally to scribe	Geography, U.S. History, Civics, Writing, and Mathematics	This accommodation requires that the student respond orally to a scribe provided by the school or respond by pointing to his/her answers. The scribe then records the student's responses in the assessment booklet.	Yes
Responds using a computer or typewriter	• Geography, U.S. History, Civics, Writing, and Mathematics	• This accommodation requires that the student record his/her answers using a computer or typewriter provided by the school. *Note: Use of the spelling/grammar check function on a computer is NOT allowed.*	Yes
Uses a template to respond	Geography, U.S. History, Civics, Writing, and Mathematics	This is a cutout or overlay provided by the school that is used to focus a student's attention on one part of a page by obscuring other parts of the page.	Yes
Uses special writing tool	Geography, U.S. History, Civics, Writing, and Mathematics	• This is a large-diameter pencil, pencil grip, or other special writing tool provided by the school that a student uses to record his/her answers in the assessment booklet. *Note: Some students' IEPs/504 Plans stipulate that they should receive this accommodation. For those students, this will be coded as an accommodation. Students who do not have this as an IEP or 504 requirement, but who typically use large-diameter pencils, pencil grips, or other special writing tools during assessments may use these for NAEP, and it will not be recorded as an accommodation.*	Yes
General and/or subject-specific directions read aloud in English	Geography, U.S. History, Civics, Writing, and Mathematics	• For this accommodation students have the general directions (same for all students) and/or the subject-specific directions read aloud, repeated, or reworded in any way, in English, so that students understand what to do.	Yes

One-on-one	Geography, U.S. History, Civics, Writing, and Mathematics	• This accommodation requires that a student is assessed individually in an area free of distractions.	Yes
Preferential seating, light, furniture	Geography, U.S. History, Civics, Writing, and Mathematics	• This accommodation requires that a student sit in a designated area for the assessment, such as away from other students to limit distractions; a location where there is access to special equipment; or close to the front of the room so that a student can see or hear more easily. It may also include special lighting and furniture, such as a study carrel used by the student.	Yes
School staff administers	Geography, U.S. History, Civics, Writing, and Mathematics	• This accommodation requires that a school staff member familiar to the student administer the session.	Yes

B-1 - COMMON CORE STATE STANDARDS INITIATIVE MEMORANDUM OF AGREEMENT

The Council of Chief State School Officers and The National Governors Association Center for Best Practices

Common Core Standards Memorandum of Agreement

Purpose. This document commits states to a state-led process that will draw on evidence and lead to development and adoption of a common core of state standards (common core) in English language arts and mathematics for grades K-12. These standards will be aligned with college and work expectations, include rigorous content and skills, and be internationally benchmarked. The intent is that these standards will be aligned to state assessment and classroom practice. The second phase of this initiative will be the development of common assessments aligned to the core standards developed through this process.

Background. Our state education leaders are committed to ensuring all students graduate from high school ready for college, work, and success in the global economy and society. State standards provide a key foundation to drive this reform. Today, however, state standards differ significantly in terms of the incremental content and skills expected of students.

Over the last several years, many individual states have made great strides in developing high-quality standards and assessments. These efforts provide a strong foundation for further action. For example, a majority of states (35) have joined the American Diploma Project (ADP) and have worked individually to align their state standards with college and work expectations. Of the 15 states that have completed this work, studies show significant similarities in core standards across the states . States also have made progress through initiatives to upgrade standards and assessments, for example, the New England Common Assessment Program.

Benefits to States. The time is right for a state-led, nation-wide effort to establish a common core of standards that raises the bar for all students. This initiative presents a significant opportunity to accelerate and drive education reform toward the goal of ensuring that all children graduate from high school ready for college, work , and competing in the global economy and society. With the adoption of this common core, participating states will be able to:

- Articulate to parents, teachers, and the general public expectations for students;
- Align textbooks, digital media, and curricula to the internationally benchmarked standards;
- Ensure professional development to educators is based on identified need and best practices;
- • Develop and implement an assessment system to measure student performance against the common core ; and

- Evaluate policy changes needed to help students and educators meet the common core standards and "end-of-high-school" expectations.

An important tenet of this work will be to increase the rigor and relevance of state standards across all participating states; therefore, no state will see a decrease in the level of student expectations that exist in their current state standards.

Process and Structure

- **Common Core State-Based Leadership.** The Council of Chief State School Officers (CCSSO) and the National Governors Association Center for Best Practices (NGA Center) shall assume responsibility for coordinating the process that will lead to state adoption of a common core of standards (see attached timeline). These organizations represent governors and state commissioners of education who are charged with defining K-12 expectations at the state level.

  As such , these organizations will facilitate a state-led process to develop common core standards in English language arts and mathematics that are:

  - Fewer, clearer, and higher, to best drive effective policy and practice;
  - Aligned with college and work expectations, so that all students are prepared for success upon graduating from high school ;
  - Inclusive of rigorous content and application of knowledge through high-order skills , so that all students are prepared for the 21st century;
  - Internationally benchmarked, so that all students are prepared for succeeding in our global economy and society; and
  - Research and evidence-based.

- **National Validation Committee.** CCSSO and the NGA Center will create an expert validation group that will serve a several purposes, including validating end-of-course expectations, providing leadership for the development of K-12 standards, and certifying state adoption of the common core standards. The group will be comprised of national and international experts on standards. Participating states will have the opportunity to nominate individuals to the group. The national validation committee shall provide an independent review of the common core standards. The national validation committee will review the common core as it is developed and offer comments, suggestions, and validation of the process and products developed by the standards development group. The group will use evidence as the driving factor in validating the common core standards.

- **Develop End-of-High-School Expectations.** CCSSO and the NGA Center will convene Achieve, ACT and the College Board in an open, inclusive, and efficient process to develop a set of end-of-high-school expectations in English language arts and mathematics based on evidence. We will ask all participating states to review and provide input on these expectations. This work will be completed by July 2009.

- **Develop K-12 Standards in English Language Arts and Math.** CCSSO and the NGA Center will convene Achieve, ACT, and the College Board in an open, inclusive, and efficient process to develop K-12 standards that are grounded in empirical research and draw on best practices in standards development. We will ask participating states to provide input into the drafting of the common core and work as partners in the common core standards development process. This work will be completed by December 2009.

- **Adoption.** The goal of this effort is to develop a true common core of state standards that are internationally benchmarked. Each state adopting the common core standards either directly or by fully aligning its state standards may do so in accordance with current state timelines for standards adoption not to exceed three (3) years.

  This effort is voluntary for states, and it is fully intended that states adopting the common core standards may choose to include additional state standards beyond the common core standards. States that choose to align their standards to the common core standards agree to ensure that the common core represents at least 85 percent of the state 's standards in English language arts and mathematics.

  Further, the goal is to establish an ongoing development process that can support continuous improvement of this first version of the common core standards based on research and evidence based learning and can support the development of assessments that are aligned to the common core standards across the states, for accountability and other appropriate purposes.

- **National Policy Forum.** CCSSO and the NGA Center will convene a National Policy Forum (Forum) comprised of signatory national organizations (e.g., the Alliance for Excellent Education, Business Roundtable, National School Boards Association, Council of Great City Schools, Hunt Institute, National Association of State Boards of Education, National Education Association, and others) to share ideas , gather input, and inform the common core standards initiative. The forum is intended as a place for refining our shared understanding of the scope and elements of a common core; sharing and coordinating the various forms of implementation of a common core ; providing a means to develop common messaging between and among participating organizations; and building public will and support.

- Federal Role. The parties support a state-led effort and not a federal effort to develop a common core of state standards; there is, however, an appropriate federal role in supporting this state-led effort. In particular, the federal government can provide key financial support for this effort in developing a common core of state standards and in moving toward common assessments, such as through the Race to the Top Fund authorized in the American Recovery and Reinvestment Act of 2009. Further, the federal government can incentivize this effort through a range of tiered incentives, such as providing states with greater flexibility in the use of existing federal funds , supporting a revised state accountability structure, and offering financial support for states to effectively implement the standards. Additionally, the federal government can provide additional long-term financial support for the development of common assessments, teacher and principal professional development, other related common core standards supports, and a research agenda that can help continually improve the common core standards over time. Finally, the federal government can revise and align existing federal education laws with the lessons learned from states ' international benchmarking efforts and from federal research.

Agreement. The undersigned state leaders agree to the process and structure as described above and attest accordingly by our signature(s) below.

Signatures
Governor:
Chief State School Officer:

B-2 - COMMON CORE STATE STANDARDS INITIATIVE PRESS RELEASE

Fifty-One States And Territories Join Common Core State Standards Initiative

NGA Center, CCSSO Convene State-led Process to Develop Common English-language arts and Mathematics Standards

WASHINGTON—The National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO) today released the names of the states and territories that have joined the Common Core State Standards Initiative: **Alabama; Arizona; Arkansas; California; Colorado; Connecticut; Delaware; District of Columbia; Florida; Georgia; Hawaii; Idaho; Illinois; Indiana; Iowa; Kansas; Kentucky; Louisiana; Maine; Maryland; Massachusetts; Michigan; Minnesota; Mississippi; Missouri; Montana; Nebraska; Nevada; New Hampshire; New Jersey; New Mexico; New York; North Carolina; North Dakota; Ohio; Oklahoma; Oregon; Pennsylvania; Puerto Rico; Rhode Island; South Carolina; South Dakota; Tennessee; Utah; Vermont; Virgin Islands; Virginia; Washington; West Virginia; Wisconsin; Wyoming**.

In the twenty-six years since the release of *A Nation at Risk,* states have made great strides in increasing the academic rigor of education standards. Yet, America's children still remain behind other nations in terms of academic achievement and preparedness to succeed.

By signing on to the common core state standards initiative, governors and state commissioners of education across the country are committing to joining a state-led process to develop a common core of state standards in English language arts and mathematics for grades K-12. These standards will be research and evidence-based, internationally benchmarked, aligned with college and work expectations and include rigorous content and skills.

"To maintain America's competitive edge, we need all of our students to be prepared and ready to compete with students from around the world," said **NGA Vice Chair Vermont Gov. Jim Douglas**. "Common standards that allow us to internationally benchmark our students' performance with other top countries have the potential to bring about a real and meaningful transformation of our education system to the benefit of all Americans."

"As state school chiefs, we have been discussing and building momentum for state-led, voluntary common standards that are both rigorous and internationally benchmarked for the past two years," stated **CCSSO President and Arkansas Commissioner of Education Ken James**. "The broad level of commitment we have received from states across the nation for this unprecedented effort is both gratifying and exciting. It also clearly illustrates that this is an idea whose time has arrived."

The Common Core State Standards Initiative is being jointly led by the NGA Center and CCSSO in partnership with Achieve, Inc; ACT and the College Board. It builds directly on recent efforts of leading organizations and states that have focused on developing college- and career-ready standards and ensures that these standards can be internationally benchmarked to top-performing countries around the world. The goal is to have a common core of state standards that states can voluntarily adopt. States may choose to include additional standards beyond the common core as long as the common core represents at least 85 percent of the state's standards in English

language arts and mathematics.

"Measuring our students against international benchmarks is an important step," said **Virginia Gov. Timothy Kaine**. "Today, we live in a world without borders. It not only matters how Virginia students compare to those in surrounding states – it matters how we compete with countries across the world."

"Only when we agree about what all high school graduates need to be successful will we be able to tackle the most significant challenge ahead of us: transforming instruction for every child," said **CCSSO President-Elect and Maine Education Commissioner Sue Gendron**. "Common standards will provide educators clarity and direction about what all children need to succeed in college and the workplace and allow states to more readily share best practices that dramatically improve teaching and learning. Our graduates and frankly, the future of our economy, cannot wait any longer for our educational practices to give equal opportunity for success to every student."

The NGA Center and CCSSO are coordinating the process to develop these standards and have created an expert validation committee to provide an independent review of the common core state standards, as well as the grade-by-grade standards. This committee will be composed of nationally and internationally recognized and trusted education experts who are neutral to – and independent of – the process. The college- and career-ready standards are expected to be completed in September 2009. The grade-by-grade standards work is expected to be completed in January 2010.

###

Founded in 1908, the National Governors Association (NGA) is the collective voice of the nation's governors and one of Washington, D.C.'s most respected public policy organizations. Its members are the governors of the 50 states, three territories and two commonwealths. NGA provides governors and their senior staff members with services that range from representing states on Capitol Hill and before the Administration on key federal issues to developing and implementing innovative solutions to public policy challenges through the NGA Center for Best Practices. For more information, visit www.nga.org.

The Council of Chief State School Officers (CCSSO) is a nonpartisan, nationwide, nonprofit organization of public officials who head departments of elementary and secondary education in the states, the District of Columbia, the Department of Defense Education Activity, and five U.S. extra-state jurisdictions. CCSSO provides leadership, advocacy, and technical assistance on major educational issues. The Council seeks member consensus on major educational issues and expresses their views to civic and professional organizations, federal agencies, Congress, and the public. www.ccsso.org.

National Governors Association, 444 N. Capitol St., Suite 267, Washington, D.C. 20001-1512 | (202) 624-5300
Copyright © 2004 National Governors Association. All rights reserved.

B-3 - DOCUMENTATION OF INTERNATIONALLY BENCHMARKED STANDARDS

International Benchmarking and the Common Core

The Common Core State Standards (CCSS) are designed to be **college- and career-ready** and **internationally benchmarked**. To that end, the development process included the review and consideration of many sources, including research studies, existing standards from the U.S and abroad, and the professional judgment of teachers, content area experts, and college faculty. This paper will briefly describe how international benchmarking was used to develop the CCSS.

What documents were used to ensure that the CCSS were internationally benchmarked?

To ensure that the standards prepare students to be globally competitive, the development team used a number of sources, including: the frameworks for PISA and TIMSS; the International Baccalaureate syllabi; the American Institutes for Research report , *Informing Grades 1-6 Mathematics Standards Development: What Can Be Learned From High-Performing Hong Kong, Korea, and Singapore* and; the A+ Composite found in *A Coherent Curriculum: The Case for Mathematics* by Bill Schmidt, Richard Houang, and Leland Cogan.

In addition, the development team looked to the standards of a number of individual countries and provinces to inform the content, structure and language of the CCSS. In *mathematics*, twelve set of standards were selected to help guide the writing of the standards: Belgium, Canada [Alberta], China, Chinese Taipei, England, Finland, Hong Kong, India, Ireland, Japan, Korea, and Singapore.[i] In *English language arts*, the writing team looked closely at ten sets of standards from Australia (New South Wales and Victoria), Canada (Alberta, British Columbia, and Ontario), England, Finland, Hong Kong, Ireland, and Singapore.[ii]

How were the international benchmarks used to inform the development of the CCSS?

The goal of the international benchmarking in the common core state standards development process was to ensure that the CCSS are as rigorous as comparable standards in the high-performing and other countries. However, the use of international benchmarks as evidence is no easy feat; it is not simply a matter of identifying the "best" source and copying it, or of aggregating all viable sources to find some set of shared expectations. Rather, international benchmarks were used to guide critical decisions in the following areas:

- *Whether particular content should be included:* One of the principal ways international standards were used in this development process was as a guide when making tough decisions about whether content should be included or excluded.
- *When content should be introduced and how that content should progress*: The progression of topics in the international mathematics standards helped the development team make decisions about when to introduce topics in the CCSS as well as when to stop focusing on them.
- *Ensuring focus and coherence*: Standards from other countries tend to be very focused, including only what is absolutely necessary.

- *Organizing and formatting the standards*: Certain organizational aspects or characteristics of international standards that promoted clarity and ease of reading and use served as a model for the CCSS.
- *Determining emphasis on particular topics in standards*: Where emphasis on particular topics was found repeatedly in international standard, this was instructive in determining their importance for inclusion in the CCSS.

* * * * *

When the final version of the K-12 Common Core State Standards is released, it will be accompanied by a discussion of the evidence that was used in their development. In the meantime, the evidence from the September 2009 draft of the College and Career Ready Standards is available: The URL for the ELA document is http://www.corestandards.org/Files/ELAEvidence.pdf, and the URL for the mathematics document is http://www.corestandards.org/Files/MathEvidence.pdf.

---

[i] Eight of these were high-performers on either TIMSS, PISA or both: Belgium, Canada [Alberta], Chinese Taipei, Finland, Hong Kong, Japan, Korea, and Singapore. England and Ireland, which have uneven performances on international assessments, were included because of their cultural links to the United States. China and India were included because of their growing global competitiveness.

[ii] Differences in language have a greater impact on the teaching and learning of language arts than of mathematics, so the teams looked primarily at English-speaking countries. All were high-performers on PISA except Singapore, which did not participate, and England, which as in mathematics was selected partly for its cultural links to the United States.

B-4 - DRAFT COMMON CORE STATE STANDARDS

CCSSI Sub-Appendix

1. College and Career Readiness Standards for Reading, Writing, and Speaking and Listening **1**

2. College and Career Readiness Standards for Mathematics **26**

3. Standards for English Language Arts K–12 **38**

4. Standards for Mathematics K-12 **99**

5. Evidence for Individual Reading, Writing, and Speaking and Listening Standards **128**

6. Evidence for Individual Math Standards **157**

College and Career Readiness Standards for Reading, Writing, and Speaking and Listening

Draft for Review and Comment

September 21, 2009

College and Career Readiness Standards for Reading, Writing, and Speaking and Listening

Table of Contents

Introduction
- Core Standards for Reading, Writing, and Speaking and Listening i
- Student Practices in Reading, Writing, and Speaking and Listening iii
- Introductory Evidence Statement for Reading, Writing, and Speaking and Listening Standards v
- How to Read the Document vii

Core Standards for Reading Informational and Literary Texts
- Standards for the Range and Content of Student Reading 1-A
- Standards for Student Performance 1-B

Core Standards for Writing
- Standards for the Range and Content of Student Writing 2-A
- Standards for Student Performance 2-B

Core Standards for Speaking and Listening
- Standards for the Range and Content of Student Speaking and Listening 3-A
- Standards for Student Performance 3-B

Applications of the Core
- Application of the Core: Research 4-A
- Application of the Core: Media 4-B

Illustrative Texts: Exemplars of Reading Text Complexity
- Introduction 5
- Illustrative Texts with Annotations 6

~~Illustrative Student Writing Samples~~ **- Coming in next draft**
- ~~Introduction~~
- ~~Student Writing Samples with Annotations~~

Sample of Works Consulted 31

Core Standards for Reading, Writing, and Speaking and Listening

The Core Standards identify essential college- and career-ready skills and knowledge in reading, writing, and speaking and listening across the disciplines. While the English language arts classroom has often been seen as the proper site for literacy instruction, this document acknowledges that the responsibility for teaching such skills must also extend to the other content areas. Teachers in the social and natural sciences, the humanities, and mathematics need to use their content area expertise to help students acquire the discipline-specific skills necessary to comprehend challenging texts and develop deep knowledge in those fields. At the same time, English language arts teachers not only must engage their students in a rich array of literature but also must help develop their students' ability to read complex works of nonfiction independently.

What is taught is just as important as how it is taught; the Core Standards should be accompanied by a comprehensive, content-rich curriculum. While this document defines the outcomes all students need to reach to be college and career ready, many important decisions about curriculum will necessarily be left to states, districts, schools, teachers, professional organizations, and parents. For example, while the standards require that students read texts of sufficient complexity, quality, and range, this document does not contain a required reading list. If states and districts choose to develop one, they should look at the Reading exemplars provided here to get a sense of the level of complexity students must be able to handle independently when they read. Educators can also model their efforts on reading lists from around the nation and the world as long as the texts ultimately included meet the range and content standards in this document.

Standards today must ready students for competition and collaboration in a global, media-saturated environment. Colleges and universities have become international meetinghouses where people from across the globe learn with and from one another. At the same time, business today is truly a worldwide enterprise. Media-related technology helps shape what goes on in both college and the workplace; indeed, it has in some important ways reshaped the very nature of communication. Students who meet the Core Standards will have the reading, writing, speaking, and listening skills to flourish in the diverse, rapidly changing environments of college and careers.

Although reading, writing, and speaking and listening are articulated separately in the standards that follow, these divisions are made for the sake of clarity and manageability. In reality, the processes of communication are tightly interrelated and often reciprocal. The act of reading can no more be separated from the written word than the act of listening can be from the spoken word. When reading, students demonstrate their comprehension most commonly through a spoken or written interpretation of the text. As students solve problems, share insights, and build the knowledge they need for college and career success, they draw simultaneously on their capacities to read, write, speak, and listen.

Student Practices in Reading, Writing, and Speaking and Listening

The following practices in reading, writing, and speaking and listening undergird and help unify the rest of the standards document. They are the "premises"—broad statements about the nature of college and career readiness in reading, writing, and speaking and listening—that underlie the individual standards statements and cut across the various sections of the document. Every idea introduced here is subsequently represented in one or more places within the larger document.

* * *

Students who are college and career ready exhibit the following capacities in their reading, writing, and speaking and listening:

1. *They demonstrate independence as readers, writers, speakers, and listeners.*

   Students can, without significant scaffolding or support, comprehend and evaluate complex text across a range of types and disciplines, and they can construct effective arguments and clearly convey intricate or multifaceted information. Likewise, students are independently able to discern a speaker's key points as well as ask questions and articulate their own ideas.

2. *They build strong content knowledge.*

   Students build a base of knowledge across a wide range of subject matter by engaging with works of quality and substance. They demonstrate their ability to become proficient in new areas through research and study. They read purposefully and listen attentively to gain both general knowledge and the specific in-depth expertise needed to comprehend subject matter and solve problems in different fields. They refine their knowledge and share it through substantive writing and speaking.

3. *They respond to the varying demands of audience, task, purpose, and discipline.*

   Students consider their reading, writing, and speaking and listening in relation to the contextual factors of audience, task, purpose, and discipline. They appreciate nuances, such as how the composition and familiarity of the audience should affect tone. They also know that different disciplines call for different types of evidence (e.g., documentary evidence in history, experimental evidence in the natural sciences).

4. *They comprehend as well as critique.*

   Students are engaged and open-minded—but skeptical—readers and listeners. They work diligently to understand precisely what an author or speaker is saying, but they also question an author's or speaker's assumptions and assess the veracity of claims.

5. *They privilege evidence.*

   Students cite specific textual evidence when offering an oral or written interpretation of a piece of writing. They use relevant evidence when supporting their own points in writing and speaking, making their reasoning clear to the reader or listener, and they constructively evaluate others' use of evidence.

6. *They care about precision.*

   Students are mindful of the impact of specific words and details, and they consider what would be achieved by different choices. Students pay especially close attention when precision matters most, such as in the case of reviewing significant data, making important distinctions, or analyzing a key moment in the action of a play or novel.

7. *They craft and look for structure.*

   Students attend to structure when organizing their own writing and speaking as well as when seeking to understand the work of others. They understand and make use of the ways of presenting information typical of different disciplines. They observe, for example, how authors of literary works craft the structure to unfold events and depict the setting.

8. *They use technology strategically and capably.*

   Students employ technology thoughtfully to enhance their reading, writing, speaking, and listening. They tailor their searches online to acquire useful information efficiently, and they integrate what they learn using technology with what they learn offline. They are familiar with the strengths and limitations of various technological tools and mediums and can select and use those best suited to their communication goals.

Introductory Evidence Statement for Reading, Writing, and Speaking and Listening Standards

To develop college- and career-ready standards for Reading, Writing, and Speaking and Listening that are rigorous, relevant, and internationally benchmarked, the work group consulted evidence from a wide array of sources. These included standards documents from high-performing states and nations; student performance data (including assessment scores and college grades); academic research; frameworks for assessments, such as NAEP; and results of surveys of postsecondary instructors and employers regarding what is most important for college and career readiness.

The evidence strongly suggests that similar reading, writing, speaking, and listening skills are necessary for success in both college and the workplace. A review of the standards of high-performing nations also suggests that many of these skills are already required in secondary schools internationally. The work group has endeavored to articulate these skills in the Core Standards, focusing educators, students, parents, and resources on what matters most.

Given that a set of standards cannot be simplistically "derived" from any body of evidence, the work group sometimes relied on reasoned judgment to interpret where the evidence was most compelling. For example, there is not a consensus among college faculty about the need for incoming students to be able to comprehend graphs, charts, and tables and to integrate information in these data displays with the information in the accompanying text. Although some evidence suggests that this skill is critical in the workplace and in some entry-level courses, college faculties from the various disciplines disagree on its value (with science and economics faculty rating it more highly than English and humanities professors do). The work group ultimately included a standard on the integration of text and data because the preponderance of the evidence suggests the skill's importance in meeting the demands of the twenty-first-century workplace and some college classrooms.

In most cases, the evidence is clearer. In writing, for example, there is unequivocal value placed on the logical progression of ideas. The expectation that high school graduates will be able to produce writing that is logical and coherent is found throughout the standards of top-performing countries and states. This ability is also valued highly by college faculty and employers. In response to such clear evidence, the work group included Writing student performance standard #5: "Create a logical progression of ideas or events, and convey the relationships among them."

A bibliography of some of the sources the work group drew upon most is included at the end of this document. The reader should also refer to the Core Standards Web site (http://www.corestandards.org), which contains a list of standards linked to relevant sources of evidence.

Finally, while the standards reflect the best evidence available to date, the decisions the work group made are necessarily provisional. The core should be reexamined periodically as additional research on college and career readiness emerges. Indeed, this document may serve as an agenda for such research.

How to Read the Document

This document is divided into three main sections: strands, applications, and supporting materials.

Strands
There are three *strands*: Reading, Writing, and Speaking and Listening. Although each strand is presented discretely for ease of understanding, the document should be considered a coherent whole.

The three strands are each in turn divided into two sections: *Standards for Range and Content* and *Standards for Student Performance*.

> **Standards for Range and Content**
> The Standards for Range and Content in each strand describe the contexts in which college- and career-ready students must be able to read, write, speak, and listen. Rather than merely supplement or illustrate the numbered list of Standards for Student Performance, the Standards for Range and Content are themselves required and carry equal force.
>
> **Standards for Student Performance**
> The Standards for Student Performance in each strand enumerate the essential skills and understandings that students who are college and career ready in reading, writing, speaking, and listening must have no later than the end of high school.

Applications
The clearest examples of the integrated nature of communication are the *Applications of the Core* for Research and Media. The Core Standards for Reading, Writing, and Speaking and Listening have been designed to include the essential skills and knowledge that students need to apply to college and career tasks, such as research and media. Rather than having an additional set of standards that would largely duplicate those already in Reading, Writing, and Speaking and Listening, the document includes the Research and Media applications that draw upon standards already in those strands. This both reaffirms the centrality of the core processes of reading, writing, speaking, and listening and shows how those processes can be combined and extended to describe key communicative acts in the classroom and workplace.

In the Research and Media applications, specific Reading, Writing, and Speaking and Listening standards are identified with a letter or letters corresponding to the relevant strand (R for Reading, W for Writing, and S&L for Speaking and Listening) and a number or letter corresponding to the statement within that strand. For example, R-14 refers to the fourteenth statement in the Standards for Student

Performance in Reading, and W-A refers to the first statement of the Standards for Range and Content in Writing.

Supporting Materials: Reading and Writing Exemplars
Reading and Writing exemplars, and their accompanying annotations, are used to lend further specificity to the standards.

> **Reading Exemplars**
> The Reading exemplars, representing a range of subject areas, time periods, cultures, and formats, illustrate the level of text complexity students ready for college and careers must be able to handle on their own. The exemplars are mostly excerpts or representations of larger works. To be truly college and career ready, students must be able to handle full texts—poems, short stories, novels, technical manuals, research reports, and the like. Annotations accompanying the exemplars explain how each text meets the criterion of high text complexity. The annotations also provide brief performance examples that further clarify the meaning and application of the standards.
>
> ~~Writing Exemplars~~ **- Coming in the next draft**
> ~~The Writing exemplars are authentic samples of student writing created across the nation under a variety of conditions and for a variety of purposes and audiences. Annotations accompanying the exemplars indicate how these samples meet the Standards for Student Performance in Writing.~~

Core Standards for Reading Informational and Literary Texts

Standards for the Range and Content of Student Reading

A. **Complexity:** A crucial factor in readiness for college and careers is students' ability to comprehend complex texts independently. In college and careers, students will need to read texts characterized by demanding vocabulary, subtle relationships among ideas or characters, a nuanced rhetorical style and tone, and elaborate structures or formats. These challenging texts require the reader's close attention and often demand rereading in order to be fully understood.

B. **Quality:** The literary and informational texts chosen for study should be rich in content and in a variety of disciplines. All students should have access to and grapple with works of exceptional craft and thought both for the insights those works offer and as models for students' own thinking and writing. These texts should include classic works that have broad resonance and are alluded to and quoted often, such as influential political documents, foundational literary works, and seminal historical and scientific texts. Texts should also be selected from among the best contemporary fiction and nonfiction and from a diverse range of authors and perspectives.

C. **Vocabulary:** To be college and career ready, students must encounter and master a rich vocabulary. Complex texts often use challenging words, phrases, and terms that students typically do not encounter in their daily lives. Specific disciplines and careers have vocabularies of their own. Attentive reading of sophisticated works in a wide range of fields, combined with close attention to vocabulary, is essential to building comprehension and knowledge.

D. **Range:** Students must be able to read a variety of literature, informational texts, and multimedia sources in order to gain the knowledge base they need for college and career readiness.

Literature: Literature enables students to access through imagination a wide range of experiences. By immersing themselves in literature, students enlarge their experiences and deepen their understanding of their own and other cultures. Careful reading of literature entails attentiveness to craft and details of design, which has broad value for students' work in college and career environments.

Informational Text: Because most college and workplace reading is nonfiction, students need to hone their ability to acquire knowledge from informational texts. Workplace and discipline-specific reading will often require students to demonstrate persistence as they encounter a large amount of unfamiliar and often technical vocabulary and concepts. Students must demonstrate facility with the features of texts particular to a variety of disciplines, such as history, science, and mathematics.

Multimedia Sources: Students must be able to integrate what they learn from reading text with what they learn from audio, video, and other digital media. Many of the same critical issues that students face when reading traditional printed texts will arise as they seek to comprehend multimedia, such as determining where the author has chosen to focus, evaluating evidence, and comparing different accounts of similar subjects.

E. **Quantity:** Students must have the capacity to handle independently the quantity of reading material, both in print and online, required in college and workforce training. Studies show that the amount of reading students face in high school is often far lower than that required for typical first-year college courses. Students need to be able to perform a close reading of a much higher volume of texts and to sort efficiently through large amounts of print and online information in search of specific facts or ideas.

Note: *The essential role of independence in college and career readiness:* The significant scaffolding that often accompanies reading in high school usually disappears in college and workforce training environments. Students must therefore have developed their ability to read texts of sufficient complexity, quality, and range on their own. To become independent, students must encounter unfamiliar texts presented without supporting materials.

Core Standards for Reading Informational and Literary Texts

Standards for Student Performance

1. Determine both what the text says explicitly and what can be inferred logically from the text.
2. Support or challenge assertions about the text by citing evidence in the text explicitly and accurately.
3. Discern the most important ideas, events, or information, and summarize them accurately and concisely.
4. Delineate the main ideas or themes in the text and the details that elaborate and support them.
5. Determine when, where, and why events unfold in the text, and explain how they relate to one another.
6. Analyze the traits, motivations, and thoughts of individuals in fiction and nonfiction based on how they are described, what they say and do, and how they interact.
7. Determine what is meant by words and phrases in context, including connotative meanings and figurative language.
8. Analyze how specific word choices shape the meaning and tone of the text.
9. Analyze how the text's organizational structure presents the argument, explanation, or narrative.
10. Analyze how specific details and larger portions of the text contribute to the meaning of the text.
11. Synthesize data, diagrams, maps, and other visual elements with words in the text to further comprehension.
12. Extract key information efficiently in print and online using text features and search techniques.
13. Ascertain the origin, credibility, and accuracy of print and online sources.
14. Evaluate the reasoning and rhetoric that support an argument or explanation, including assessing whether the evidence provided is relevant and sufficient.
15. Analyze how two or more texts with different styles, points of view, or arguments address similar topics or themes.
16. Draw upon relevant prior knowledge to enhance comprehension, and note when the text expands on or challenges that knowledge.
17. Apply knowledge and concepts gained through reading to build a more coherent understanding of a subject, inform reading of additional texts, and solve problems.
18. Demonstrate facility with the specific reading demands of texts drawn from different disciplines, including history, literature, science, and mathematics.

Note: *These Standards for Student Performance, as is the case for every strand, must be demonstrated across the range and content from the preceding page.* They are meant to apply to fiction and nonfiction. For example:
- "Determine when, where, and why events unfold" applies to plot and setting in literature as well as the sequence of a scientific procedure.
- "Analyze the traits, motivations, and thoughts of individuals" applies to studying characters in fiction and figures in historical texts.

Core Standards for Writing

Standards for the Range and Content of Student Writing

A. **Purpose:**

Make an Argument: While many high school students have experience presenting their opinions, they need to be able to make arguments supported by evidence in order to be ready for careers and college. Students must be able to frame the debate over a claim, present the reasoning and evidence for the argument, and acknowledge and address its limitations. In some cases, students will make arguments to gain entry to college or to obtain a job, laying out their qualifications or experience. In college, students might defend an interpretation of a work of literature or of history; in the workplace, employees might write to recommend a course of action.

Inform or Explain: In college and in workforce training, writing is a key means for students to show what they know and to share what they have seen. Writing to inform or explain often requires students to integrate complex information from multiple sources in a lucid fashion. Explanations can take the form of laying out facts about a new technology or documenting findings from historical research; well-crafted explanations often make fresh connections and express ideas creatively.

B. **Audience:** Students must adapt their writing so that it is appropriate to the audience by choosing words, information, structures, and formats that conform to the conventions of the discipline in which they are writing. The form and use of evidence in literary analysis, for example, are likely to be quite different from those in geology or business. Students must also be able to consider their audience's background knowledge and potential objections to an argument.

C. **Situation:**

On-demand Writing: Students must have the flexibility, concentration, and fluency to produce high-quality first-draft text under a tight deadline. College and career readiness requires that students be able to write effectively to a prompt on an exam or respond quickly yet thoughtfully to a supervisor's urgent request for information.

Writing over Time: Students must be able to revisit and make improvements to a piece of their writing over multiple drafts when circumstances encourage or require it. To improve writing through revision, students must be capable of distinguishing good changes from ones that would weaken the writing.

D. **Technology and Collaboration:** Technology offers students powerful tools for producing, editing, and distributing writing as well as for collaboration. Especially in the workplace, writers often use technology to produce documents and to provide feedback.

E. **Quantity:** The evidence is clear that, in order to become better writers, students must devote significant time to producing writing. Students must practice writing several analytical pieces each term if they are to achieve the deep analysis and interpretation of content expected for college and careers.

Note on narrative writing:

Narrative writing is an important mode of writing; it is also a component of making an argument and writing to inform or explain. Telling an interesting story effectively or providing an accurate account of a historical incident requires the skillful use of narrative techniques. Narrative writing requires that students present vivid, relevant details to situate events in a time and place and also craft a structure that lends a larger shape and significance to those details. As an easily grasped and widely used way to share information and ideas with others, narrative writing is a principal stepping-stone to writing forms directly relevant to college and career readiness.

Core Standards for Writing

Standards for Student Performance

1. Establish and refine a topic or thesis that addresses the specific task and audience.
2. Gather the information needed to build an argument, provide an explanation, or address a research question.
3. Sustain focus on a specific topic or argument.
4. Support and illustrate arguments and explanations with relevant details, examples, and evidence.
5. Create a logical progression of ideas or events, and convey the relationships among them.
6. Choose words and phrases to express ideas precisely and concisely.
7. Use varied sentence structures to engage the reader and achieve cohesion between sentences.
8. Develop and maintain a style and tone appropriate to the task, purpose, and audience.
9. Demonstrate command of the conventions of standard written English, including grammar, usage, and mechanics.
10. Represent and cite accurately the data, conclusions, and opinions of others, effectively incorporating them into one's own work while avoiding plagiarism.
11. Assess the quality of one's own writing, and, when necessary, strengthen it through revision.
12. Use technology as a tool to produce, edit, and distribute writing.

When **writing to inform or explain**, students must also do the following:

13. Synthesize information from multiple relevant sources, including graphics and quantitative information when appropriate, to provide an accurate picture of that information.
14. Convey complex information clearly and coherently to the audience through purposeful selection and organization of content.
15. Demonstrate understanding of content by reporting facts accurately and anticipating reader misconceptions.

When **writing arguments**, students must also do the following:

16. Establish a substantive claim, distinguishing it from alternate or opposing claims.
17. Link claims and evidence with clear reasons, and ensure that the evidence is relevant and sufficient to support the claims.
18. Acknowledge competing arguments or information, defending or qualifying the initial claim as appropriate.

Note: "The conventions of standard written English" encompass a range of commonly accepted language practices designed to make writing clear and widely understood. When formal writing contains errors in grammar, usage, and mechanics, its meaning is obscured, its message is too easily dismissed, and its author is often judged negatively. Proper sentence structure, correct verb formation, careful use of verb tense, clear subject-verb and pronoun-antecedent agreement, conventional usage, and appropriate punctuation are of particular importance to formal writing.

Core Standards for Speaking and Listening

Standards for the Range and Content of Student Speaking and Listening

A. **Group and One-to-One Situations:** Students are expected to be able to speak and listen effectively in both groups and one-to-one. Success in credit-bearing college coursework, whether in the humanities, mathematics, or the sciences, depends heavily on being able to take in and respond to the concepts and information conveyed in lectures and class discussions. Success in the workplace is similarly dependent on listening attentively to colleagues and customers and expressing ideas clearly and persuasively.

   These speaking and listening skills may need to be applied differently in different settings. The immediate communication between two people might be replaced by formal turn taking in large-group discussions. When working in classroom or workplace teams, students should be able to ask questions that initiate thoughtful discussions, gain the floor in respectful ways, and build on the contributions of others to complete tasks or reach consensus.

B. **Varied Disciplinary Content:** Students must adapt their speaking and listening to a range of disciplines to communicate effectively. Each academic discipline and industry has its own vocabulary and conventions; for instance, evidence is handled and discussed differently in literary analysis than in history or medicine or the sciences. College- and career-ready students must develop a foundation of disciplinary knowledge and conventions in order not only to comprehend the complexity of information and ideas but also to present and explain them.

C. **Multimedia Comprehension:** New technologies expand the role that speaking and listening skills will play in acquiring and sharing knowledge. Students will need to view and listen to diverse media to gain knowledge and also must integrate this information with what they learn through reading text online as well as in print. When speaking, students can draw on media to illustrate their points, make data and evidence vivid, and engage their audience. Multimedia accelerates the speed at which connections between reading, writing, speaking, and listening can be made, requiring students to be ready to use these skills nearly simultaneously.

Core Standards for Speaking and Listening

Standards for Student Performance

1. Select and use a format, organization, and style appropriate to the topic, purpose, and audience.
2. Present information, findings, and supporting evidence clearly and concisely.
3. Make strategic use of multimedia elements and visual displays of data to gain audience attention and enhance understanding.
4. Demonstrate command of formal Standard English when appropriate to task and audience.
5. Listen to complex information, and discern the main ideas, the significant details, and the relationships among them.
6. Follow the progression of the speaker's message, and evaluate the speaker's point of view, reasoning, and use of evidence and rhetoric.
7. Ask relevant questions to clarify points and challenge ideas.
8. Respond constructively to advance a discussion and build on the input of others.

Note: "Style appropriate to the topic, purpose, and audience" includes word choice specific to the demands of the discipline as well as delivery techniques such as gestures and eye contact that contribute to effective message delivery.

"Evaluate the speaker's point of view, reasoning, and use of evidence and rhetoric" includes distinguishing facts from opinions and determining whether the speaker is biased and evidence has been distorted.

Application of the Core: Research

The Core Standards for Reading, Writing, and Speaking and Listening have been designed to include the essential skills and knowledge that students need to apply to college and career tasks such as research. This section shows how standards in the core incorporate the skills of research.

To be college and career ready, students must engage in research and present their findings in writing and orally, in print and online. The ability to conduct research independently and effectively plays a fundamental role in gaining knowledge and insight in college and the workplace.

Research as described here is not limited to the formal, extended research paper nor simply to gathering information from books; rather, research encompasses a flexible yet systematic approach to resolving questions and investigating issues through the careful collection, analysis, synthesis, and presentation of information from a wide range of print and digital sources, such as historical archives and online interviews. With well-developed research skills, students have the tools to engage in sustained inquiry as well as the sort of short, focused research projects that typify many assignments in college and the workplace.

Research in the digital age offers new possibilities as well as new or heightened challenges. While the Internet provides ready access to unprecedented amounts of primary and secondary source material (such as oral histories, historical documents, maps, and scientific reports), students sorting through this wealth of data must be skilled at and vigilant in determining the origin and credibility of these sources.

The following Core Standards pertain to elements of the research process and particular research skills required for college and career readiness:

Formulate research questions:
- Establish and refine a topic or thesis that addresses the specific task and audience. (W-1)
- Establish a substantive claim, distinguishing it from alternate or opposing claims. (W-16)

Gather and evaluate relevant information from a range of sources:
- Gather the information needed to build an argument, provide an explanation or address a research question. (W-2)
- Extract key information efficiently in print and online using text features and search techniques. (R-12)
- Ascertain the origin, credibility, and accuracy of print and online sources. (R-13)
- Evaluate the reasoning and rhetoric that support an argument or explanation, including assessing whether the evidence provided is relevant and sufficient. (R-14)
- Follow the progression of the speaker's message and evaluate the speaker's point of view, reasoning, and use of evidence and rhetoric. (S&L-6)

Analyze research sources:
- Delineate the main ideas or themes in the text and the details that elaborate and support them. (R-4)
- Listen to complex information and discern the main ideas, the significant details, and the relationships among them. (S&L-5)
- Discern the most important ideas, events, or information and summarize them accurately and concisely. (R-3)
- Synthesize data, diagrams, maps, and other visual elements with words in the text to further comprehension. (R-11)
- Synthesize information from multiple relevant sources, including graphics and quantitative information when appropriate, to provide an accurate picture of that information. (W-13)
- Analyze how two or more texts with different styles, points of view, or arguments address similar topics or themes. (R-15)
- Acknowledge competing arguments or information, defending or qualifying the initial claim as appropriate. (W-18)

Report findings:
- Link claims and evidence with clear reasons and ensure that the evidence is relevant and sufficient to support the claims. (W-17)
- Convey complex information clearly and coherently to the audience through purposeful selection and organization of the content. (W-14)
- Demonstrate understanding of the content by reporting the facts accurately and anticipating reader misconceptions. (W-15)
- Present information, findings, and supporting evidence, clearly and concisely. (S&L-2)
- Support and illustrate arguments and explanations with relevant details, examples, and evidence. (W-4)
- Represent and cite accurately the data, conclusions, and opinions of others, effectively incorporating them into one's own work while avoiding plagiarism. (W-10)

Application of the Core: Media

The Core Standards for Reading, Writing, and Speaking and Listening have been designed to include the essential skills and knowledge that students need to apply to college and career tasks such as media analysis and creation. This section shows how standards in the core apply to media.

Rapidly evolving technologies are powerful tools—but only for those who have the skills to put them to work. As the capability of the technology grows, students' command of these skills must only increase.

At the core of media mastery are the same fundamental capacities as are required offline in traditional print forms: an ability to access, understand, and evaluate complex materials and messages and to produce clear, effective communications. Media mastery does, however, call upon students to apply these core skills in new ways and contexts. Media enable students to communicate quickly with a large, often unknown, and broadly diverse audience. Whereas in the past, students may have had days or weeks to digest new information and formulate a response, the online environment pushes students to exercise judgment and present their responses in a matter of minutes.

Speed is not the only new factor. In the electronic world, reading, writing, speaking, and listening are uniquely intertwined. Multimedia forms force students to engage with constantly changing combinations of elements, such as graphics, images, hyperlinks, and embedded video and audio. The technology itself is changing quickly, creating new urgency for adaptation and flexibility on the part of students.

The following Core Standards describe the particular reading, writing, speaking, and listening skills that students will need in order to use media effectively in college and careers:

Standards for Range and Content drawn from each strand

Multimedia Sources: Students must be able to integrate what they learn from reading text with what they learn from audio, video, and other digital media. Many of the same critical issues that students face when reading traditional printed texts will arise as they seek to comprehend multimedia, such as determining where the author has chosen to focus, evaluating evidence, and comparing different accounts of similar subjects. [R-D]

Technology and Collaboration: Technology offers students powerful tools for producing, editing, and distributing writing as well as for collaboration. Especially in the workplace, writers often use technology to produce documents and to provide feedback. [W-D]

Multimedia Comprehension: New technologies expand the role that speaking and listening skills will play in acquiring and sharing knowledge. Students will need to view and listen to diverse media to gain knowledge and integrate this information with what they learn through reading text online as well as in print. When speaking, students can draw on media to illustrate their points, make data and evidence vivid, and engage their audiences. Multimedia accelerates the speed at which connections between reading, writing, and speaking and listening can be made, requiring students to be ready to use these skills nearly simultaneously. [S&L-C]

Standards for Student Performance drawn from each strand

Gather information from a wide array of electronic sources and multimedia:
- Extract key information efficiently in print and online using text features and search techniques. (R-12)
- Synthesize data, diagrams, maps, and other visual elements with words in the text to further comprehension. (R-11)
- Listen to complex information and discern the main ideas, the significant details, and the relationships among them. (S&L-5)

Evaluate information from digital media:
- Ascertain the origin, credibility, and accuracy of print and online sources. (R-13)
- Evaluate the reasoning and rhetoric that support an argument or explanation, including assessing whether the evidence provided is relevant and sufficient. (R-14)
- Follow the progression of the speaker's message and evaluate the speaker's point of view, reasoning, and use of evidence and rhetoric. (S&L-6)

Create and distribute media communications:
- Use technology as a tool to produce, edit, and distribute writing. (W-12)
- Synthesize information from multiple relevant sources, including graphics and quantitative information when appropriate, to provide an accurate picture of that information. (W-13)
- Make strategic use of multimedia elements and visual displays of data to gain audience attention and enhance understanding. (S&L-3)

Illustrative Texts

Exemplars of Reading Text Complexity

As described in the Standards for the Range and Content of Student Reading, college- and career-ready students must be able to read texts of sufficient complexity on their own. Studies show that many students who are unable to read sufficiently challenging texts independently by the end of high school struggle with the reading demands of college; many twenty-first-century careers likewise demand that people be able to obtain, search through, and comprehend large amounts of often technical information.

To develop that ability, students should engage with high-quality texts that provide strong models of thinking and writing, that challenge them intellectually, and that introduce them to rich content, sophisticated vocabulary, and examples of exceptional craft. The reading students do should be broad and deep, allowing them to extend their knowledge of particular subjects as well as learn about the features of texts written for different disciplines, audiences, and purposes. While no sampling can do justice to the numerous ways in which different authors craft complex prose, as a collection the exemplar texts below illustrate the level of complexity that college- and career-ready students should be able to handle independently by the end of high school. Texts in translation have not been included in this draft but will be part of future drafts.

How Text Complexity was Determined

In addition to surveys of required reading in twelfth grade and the first year of college as well as consultations with experts, two leading measurement systems were used to help make the selections below. The first system—a methodology described by Jeanne Chall and her coauthors in *The Qualitative Assessment of Text Difficulty*—employs trained raters to measure the sophistication of vocabulary, density of ideas, and syntactic complexity in a text as well as the general and subject-specific knowledge and the level of reasoning required for understanding it. The second system, Coh-Metrix, incorporates into its computer-based analysis more than sixty specific indices of syntax, semantics, readability, and cohesion to assess text complexity. Central to its assessment are measures of text cohesiveness, which is the degree to which the text uses explicit markers to link ideas. By analyzing the degree to which those links are missing in a text—and therefore the degree to which a reader must make inferences to connect ideas—this measure gauges a key factor in the comprehension demand of a text.

The two methods described above have limitations. The complexity of poems (such as "O Captain! My Captain!") cannot be assessed by Coh-Metrix because poetry adheres to different rules of construction than does prose. Similarly, while individual stories in the sample *New York Times* front pages can be measured for complexity by Coh-Metrix, the method does not capture how the electronic environment enhances or detracts from readability. However, for those exemplar texts whose complexity could be measured by both systems, comparable results were yielded by Coh-Metrix and the Chall method.

Note: The samples of complex text are supplemented by brief performance examples that further clarify the meaning of the standards. These illustrate specifically the application of the performance standards to texts of sufficient complexity, quality, and range. Relevant standards are noted in brackets following each sample performance.

Notes on Illustrative Text #1

Pride and Prejudice by Jane Austen

Jane Austen's *Pride and Prejudice* is a sophisticated literary text featuring multiple plotlines, a style and word choice reflective of its time period and setting, and subtle relationships among characters; the excerpt here can only illustrate some of the complexities that readers of the full work will encounter. The novel's opening sentence—"It is a truth universally acknowledged, that a single man in possession of a good fortune, must be in want of a wife"—signals that today's readers will need to employ literary imagination and historical context to re-create for themselves a world largely in the past. The novel's style is elaborate, with many lengthy and, to the modern ear, formal-sounding sentences typical of the period during which the novel was written. While the dialogue is less formal than much of the surrounding text, words and phrases such as *let* (to mean "rent" or "lease") and *chaise and four* (referring to a type of carriage) mark the novel's setting. The excerpt suggests also the kind of close reading of the subtleties of character that readers must perform. The banter between Mr. and Mrs. Bennet reveals both affection and difference of opinion, and it offers clues to the mores of well-to-do English society in the early nineteenth century.

Sample performance aligned with the Core Standards

Students analyze the first impressions given of Mr. and Mrs. Bennet in the first chapter of *Pride and Prejudice* based on how the characters are described, what they say and do, and how they interact. Students compare these first impressions with their later understanding based on how the characters develop throughout the novel. [R-6]

Illustrative Text #1

from *Pride and Prejudice*

Chapter 1

It is a truth universally acknowledged, that a single man in possession of a good fortune, must be in want of a wife.

However little known the feelings or views of such a man may be on his first entering a neighbourhood, this truth is so well fixed in the minds of the surrounding families that he is considered as the rightful property of some one or other of their daughters.

"My dear Mr. Bennet," said his lady to him one day, "have you heard that Netherfield Park is let at last?"

Mr. Bennet replied that he had not.

"But it is," returned she; "for Mrs. Long has just been here, and she told me all about it."

Mr. Bennet made no answer.

"Do not you want to know who has taken it?" cried his wife impatiently.

"*You* want to tell me, and I have no objection to hearing it."

This was invitation enough.

"Why, my dear, you must know, Mrs. Long says that Netherfield is taken by a young man of large fortune from the north of England; that he came down on Monday in a chaise and four to see the place, and was so much delighted with it, that he agreed with Mr. Morris immediately; that he is to take possession before Michaelmas, and some of his servants are to be in the house by the end of next week."

"What is his name?"

"Bingley."

"Is he married or single?"

"Oh! single, my dear, to be sure! A single man of large fortune; four or five thousand a year. What a fine thing for our girls!"

"How so? how can it affect them?"

"My dear Mr. Bennet," replied his wife, "how can you be so tiresome! You must know that I am thinking of his marrying one of them."

"Is that his design in settling here?"

"Design! nonsense, how can you talk so! But it is very likely that he *may* fall in love with one of them, and therefore you must visit him as soon as he comes."

"I see no occasion for that. You and the girls may go, or you may send them by themselves, which perhaps will be still better, for as you are as handsome as any of them, Mr. Bingley might like you the best of the party."

"My dear, you flatter me. I certainly *have* had my share of beauty, but I do not pretend to be any thing extraordinary now. When a woman has five grown-up daughters she ought to give over thinking of her own beauty."

"In such cases a woman has not often much beauty to think of."

"But, my dear, you must indeed go and see Mr. Bingley when he comes into the neighbourhood."

"It is more than I engage for, I assure you."

"But consider your daughters. Only think what an establishment it would be for one of them. Sir William and Lady Lucas are determined to go, merely on that account, for in general, you know, they visit no new-comers. Indeed you must go, for it will be impossible for us to visit him if you do not."

"You are over-scrupulous surely. I dare say Mr. Bingley will be very glad to see you; and I will send a few lines by you to assure him of my hearty consent to his marrying whichever he chuses of the girls: though I must throw in a good word for my little Lizzy."

"I desire you will do no such thing. Lizzy is not a bit better than the others; and I am sure she is not half so handsome as Jane, nor half so good-humoured as Lydia. But you are always giving *her* the preference."

"They have none of them much to recommend them," replied he; "they are all silly and ignorant, like other girls; but Lizzy has something more of quickness than her sisters."

"Mr. Bennet, how can you abuse your own children in such a way! You take delight in vexing me. You have no compassion on my poor nerves."

"You mistake me, my dear. I have a high respect for your nerves. They are my old friends. I have heard you mention them with consideration these twenty years at least."

"Ah! you do not know what I suffer."

"But I hope you will get over it, and live to see many young men of four thousand a year come into the neighbourhood."

"It will be no use to us if twenty such should come, since you will not visit them."

"Depend upon it, my dear, that when there are twenty, I will visit them all."

Mr. Bennet was so odd a mixture of quick parts, sarcastic humour, reserve, and caprice, that the experience of three-and-twenty years had been insufficient to make his wife understand his character. *Her* mind was less difficult to develope. She was a woman of mean understanding, little information, and uncertain temper. When she was discontented she fancied herself nervous. The business of her life was to get her daughters married; its solace was visiting and news.

Notes on Illustrative Text #2

"O Captain! My Captain!" by Walt Whitman

Though poetry's complexity cannot be assessed by the measures of readability used for the prose exemplars, "O Captain! My Captain!" by Walt Whitman clearly has many of the features of complex texts listed in the Standards for the Range and Content of Student Reading. Modern readers must work to understand what would have been obvious to readers in 1865: "O Captain! My Captain!" is an extended-metaphor poem intended to convey Whitman's and the North's grief over the assassination of Abraham Lincoln so near the conclusion of hostilities in the Civil War. Every element in the poem stands for something else, with the captain representing Lincoln, the ship representing the Union (or the "ship of state"), the voyage representing the war, and so on. Historical context, along with skill in reading literature, is thus particularly important to interpreting this text.

Sample performance aligned with the Core Standards

Students apply knowledge gained from reading the *New York Times* articles on Lincoln's assassination to their understanding of the poem "O Captain! My Captain!" Specifically, students draw on the description of the crowd's response to the attack on Lincoln to inform their understanding of Whitman's poem. **[R-17]**

Illustrative Text #2

"O Captain! My Captain!" by Walt Whitman

O Captain! my Captain! our fearful trip is done,
The ship has weather'd every rack, the prize we sought is won,
The port is near, the bells I hear, the people all exulting,
While follow eyes the steady keel, the vessel grim and daring,
But O heart! heart! heart!
O the bleeding drops of red,
Where on the deck my Captain lies,
Fallen cold and dead.

O Captain! my Captain! rise up and hear the bells;
Rise up—for you the flag is flung—for you the bugle trills,
For you bouquets and ribbon'd wreaths—for you the shores a-crowding,
For you they call, the swaying mass, their eager faces turning,
Here, Captain! dear father!
This arm beneath your head;
It is some dream that on the deck
You've fallen cold and dead.

My Captain does not answer, his lips are pale and still
My father does not feel my arm, he has no pulse nor will,
The ship is anchor'd safe and sound, its voyage closed and done,
From fearful trip, the victor ship comes in with object won;
Exult, O shores, and ring O bells!
But I with mournful tread
Walk the deck my Captain lies,
Fallen cold and dead.

Notes on Illustrative Text #3

The front page of the *New York Times*, April 15, 1865

The challenge posed to a modern reader by the front page of the *New York Times* on April 15, 1865, is significant in terms of format, timeliness, and point of view. Unlike the graphically heavy front page of modern newspapers, this 1865 *New York Times* front page is mostly uninterrupted columns of text. The reader is obviously expected to proceed from top to bottom and left to right across the page, but little other guidance is provided. Because the assassination of Lincoln was still "breaking news" as this edition of the *Times* would have gone to press, some details of the event would have not yet been known; readers will have to sort out what they know about the assassination from what the people reading the paper on that Saturday morning would just have been learning. Three accounts of the events rather than one are provided here, and the sourcing and tone vary greatly. Certain details found in one place are contradicted in another: the "Detail of the Occurrence," for example, suggests that Lincoln may not have been mortally wounded, but the main headline in the top left-hand corner of the page states "No Hopes Entertained of His Recovery." While the first two accounts aim at a certain objectivity, the third begins with a flourish that may surprise readers more used to a restrained style of journalism: "A stroke from Heaven laying the whole of the city in instant ruin could not have startled us as did the word that broke from Ford's Theatre a half hour ago that the President had been shot."

Sample performance aligned with the Core Standards

Students analyze how the three different accounts on the front page portray Lincoln's assassination, including which details are similar or different. [R-15]

Illustrative Text #3: The front page of the *New York Times*, April 15, 1865

http://timesmachine.nytimes.com/browser/1865/04/15/P1

The New-York Times.

NEW-YORK, SATURDAY, APRIL 15, 1865. PRICE FOUR CENTS.

AWFUL EVENT.

President Lincoln Shot by an Assassin.

The Head Done at Ford's Theatre Last Night.

THE ACT OF A DESPERATE REBEL.

The President Both Alive and Last Assassin.

No Hope Entertained of His Recovery.

Attempted Assassination of Secretary Seward.

DETAILS OF THE DREADFUL TRAGEDY.

[OFFICIAL.]

War Department, Washington, April 15--1:30 A.M.

Maj.-Gen. Dix:

This evening, at about 9:30 P.M., at Ford's Theater, the President, while sitting in his private box with Mrs. Lincoln, Mrs. Harris, and Major Rathbum, was shot by an assassin, who suddenly entered the box and approached behind the President.

The assassin then leaped upon the stage, brandishing a large dagger or knife, and made his escape in the rear of the theater.

EUROPEAN NEWS

ANOTHER ACCOUNT.

Special Dispatch to the New-York Times.

Washington, Friday, April 14, 11:15 P.M.

A stroke from Heaven laying the whole of the city in instant ruin could not have startled us as did the word that broke from Ford's Theater a half hour ago that the President had been shot. It flew everywhere in five minutes, and set five thousand people in swift and excited motion on the instant.

DETAIL OF THE OCCURRENCE.

Washington, Friday, April 14--12:30 A.M.

The President was shot in a theater tonight, and is, perhaps, mortally wounded. Secretary Seward was also assassinated.

SECOND DISPATCH.

Washington, Friday, April 14. President Lincoln and wife, with other friends, this evening visited Ford's Theater for the purpose of witnessing the performance of the "American Cousin."

Notes on Illustrative Text #4

The Declaration of Independence

The Declaration of Independence represents the kind of rich primary source material students should be able to read on their own by the end of high school. Though some of the lines ("We hold these truths . . .") are familiar to most American readers, the case against Great Britain that the Declaration lays out, expressed in elevated, sometimes archaic language (*unalienable*, *hath*, *usurpations*), requires careful examination to follow in its particulars. The beginning of the document, excerpted here, poses a reading challenge partly because of its philosophical abstractness. The first three sentences, although formally divided, are one continuous list of propositions ("truths") about the nature of government and the rights of the people. Further complicating the reading is that there is little explicit cohesion between sentences—links supplied by words and phrases such as "for example," "moreover," or "in addition"—to help readers understand the relationship between the ideas being expressed.

Sample performance aligned with the Core Standards

Students compare the argument that the Declaration makes justifying revolution to Martin Luther King, Jr.'s defense of civil disobedience in *Letter from Birmingham Jail*. [R-15]

Illustrative Text #4

from The Declaration of Independence

When in the Course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the Laws of Nature and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. —That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed, —That whenever any Form of Government becomes destructive to these ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their Safety and Happiness. Prudence, indeed, will dictate that Governments long established should not be changed for light and transient causes; and accordingly all experience hath shewn, that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same Object evinces a design to reduce them under absolute Despotism, it is their right, it is their duty, to throw off such Government, and to provide new guards for their future security. —Such has been the patient sufferance of these Colonies; and such is now the necessity which constrains them to alter their former Systems of Government. The history of the present King of Great Britain is a history of repeated injuries and usurpations, all having in direct object the establishment of an absolute Tyranny over these States. To prove this, let Facts be submitted to a candid world.

Notes on Illustrative Text #5

Letter from Birmingham Jail by Martin Luther King, Jr.

Martin Luther King, Jr.'s, *Letter from Birmingham Jail* presents many challenges to the reader in terms of its format, purpose, tone, use of allusions, and language. Apart from letters to the editor (most of which are relatively short), public letters such as King's are uncommon today. The purpose of the text may also be confusing: King is ostensibly addressing his "Fellow Clergymen," but skilled readers will reasonably infer that King's message is intended for a broader audience. Though the tone of the text is measured, King's passion for his cause comes through. The author frequently points outside the *Letter* itself through allusions to other texts, including the Hebrew and Christian scriptures. Moreover, King uses sophisticated vocabulary (*cognizant*, *mutuality*, *provincial*, *gainsaying*) and figurative language (*garment of destiny*) throughout his text. However, the piece is both coherent in that its sequence is signaled ("While confined here . . . But more basically . . . Moreover, I am cognizant . . .") and cohesive in that its clauses and sentences are logically linked for the reader ("Just as the prophets . . . and just as the Apostle Paul . . . so am I compelled . . .").

Sample performance aligned with the Core Standards

Students evaluate the reasoning and rhetoric of the three very different arguments King makes to defend his being in Birmingham. Students assess the different kinds of evidence he uses to support each argument. [R-14]

Illustrative Text #5

from *Letter from Birmingham Jail**

License granted by Intellectual Properties Management, Atlanta, Georgia, as exclusive licensor of the King Estate.

My Dear Fellow Clergymen:

While confined here in the Birmingham city jail, I came across your recent statement calling my present activities "unwise and untimely." Seldom do I pause to answer criticism of my work and ideas. If I sought to answer all the criticisms that cross my desk, my secretaries would have little time for anything other than such correspondence in the course of the day, and I would have no time for constructive work. But since I feel that you are men of genuine good will and that your criticisms are sincerely set forth, I want to try to answer your statements in what I hope will be patient and reasonable terms.

I think I should indicate why I am here In Birmingham, since you have been influenced by the view which argues against "outsiders coming in." I have the honor of serving as president of the Southern Christian Leadership Conference, an organization operating in every southern state, with headquarters in Atlanta, Georgia. We have some eighty-five affiliated organizations across the South, and one of them is the Alabama Christian Movement for Human Rights. Frequently we share staff, educational and financial resources with our affiliates. Several months ago the affiliate here in Birmingham asked us to be on call to engage in a nonviolent direct-action program if such were deemed necessary. We readily consented, and when the hour came we lived up to our promise. So I, along with several members of my staff, am here because I was invited here I am here because I have organizational ties here.

But more basically, I am in Birmingham because injustice is here. Just as the prophets of the eighth century B.C. left their villages and carried their "thus saith the Lord" far beyond the boundaries of their home towns, and just as the Apostle Paul left his village of Tarsus and carried the gospel of Jesus Christ to the far corners of the Greco-Roman world, so am I. compelled to carry the gospel of freedom beyond my own home town. Like Paul, I must constantly respond to the Macedonian call for aid.

Moreover, I am cognizant of the interrelatedness of all communities and states. I cannot sit idly by in Atlanta and not be concerned about what happens in Birmingham. Injustice anywhere is a threat to justice everywhere. We are caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly, affects all indirectly. Never again can we afford to live with the narrow, provincial "outside agitator" idea. Anyone who lives inside the United States can never be considered an outsider anywhere within its bounds.

*As reprinted in *Why We Can't Wait* by King, Jr., M. L. (2000). New York City: Signet Classics.

Notes on Illustrative Text #6

Toni Morrison's Nobel lecture, 1993

Toni Morrison's Nobel lecture, though originally delivered orally, can be read on the page as a complex work of analysis and criticism. Its structure, syntax, imagery, language, and density of ideas contribute to the challenge of studying it in this manner. As this excerpt shows, Morrison begins with a folktale. While the "once upon a time" opening may lead readers into thinking that the lecture will primarily be in narrative form, Morrison uses the tale mainly as a springboard for an abstract, allegorical discussion of language, writing, and those who have no voice in society. Morrison often employs sophisticated sentences that require patience and concentration to follow. Readers may recognize places where Morrison varies sentence patterns to change pace and rhythm—particularly important to the oral delivery of the text. The images Morrison creates are powerful and poetic, the diction is elevated and academic, and the word choice is metaphorical and unconventional: "Official language smitheryed to sanction ignorance and preserve privilege is a suit of armor polished to shocking glitter, a husk from which the knight departed long ago." The richness and abstractness of the ideas in the lecture mean that rereadings may be necessary to comprehend and evaluate the ideas fully.

Sample performance aligned with the Core Standards

Students determine what Morrison means when she compares language to "a bird in the hand," including the different connotations of this phrase that she develops throughout the lecture. Students also explore what Morrison means by saying that both the bird and language can be "dead or alive." [R-7]

Illustrative Text #6

from Toni Morrison's Nobel lecture, 1993

Copyright © The Nobel Foundation 1993. Reprinted by permission.

"Once upon a time there was an old woman. Blind but wise." Or was it an old man? A guru, perhaps. Or a griot soothing restless children. I have heard this story, or one exactly like it, in the lore of several cultures.

"Once upon a time there was an old woman. Blind. Wise."

In the version I know the woman is the daughter of slaves, black, American, and lives alone in a small house outside of town. Her reputation for wisdom is without peer and without question. Among her people she is both the law and its transgression. The honor she is paid and the awe in which she is held reach beyond her neighborhood to places far away; to the city where the intelligence of rural prophets is the source of much amusement.

One day the woman is visited by some young people who seem to be bent on disproving her clairvoyance and showing her up for the fraud they believe she is. Their plan is simple: they enter her house and ask the one question the answer to which rides solely on her difference from them, a difference they regard as a profound disability: her blindness. They stand before her, and one of them says, "Old woman, I hold in my hand a bird. Tell me whether it is living or dead."

She does not answer, and the question is repeated. "Is the bird I am holding living or dead?"

Still she doesn't answer. She is blind and cannot see her visitors, let alone what is in their hands. She does not know their color, gender or homeland. She only knows their motive.

The old woman's silence is so long, the young people have trouble holding their laughter.

Finally she speaks and her voice is soft but stern. "I don't know", she says. "I don't know whether the bird you are holding is dead or alive, but what I do know is that it is in your hands. It is in your hands."

Her answer can be taken to mean: if it is dead, you have either found it that way or you have killed it. If it is alive, you can still kill it. Whether it is to stay alive, it is your decision.

Whatever the case, it is your responsibility.

For parading their power and her helplessness, the young visitors are reprimanded, told they are responsible not only for the act of mockery but also for the small bundle of life sacrificed to achieve its aims. The blind woman shifts attention away from assertions of power to the instrument through which that power is exercised.

Speculation on what (other than its own frail body) that bird-in-the-hand might signify has always been attractive to me, but especially so now thinking, as I have been, about the work I do that has brought me to this company. So I choose to read the bird as language and the woman as a practiced writer. She is worried about how the language she dreams in, given to her at birth, is handled, put into service, even withheld from her for certain nefarious purposes. Being a writer she thinks of language partly as a system, partly as a living thing over which one has control, but mostly as agency—as an act with consequences. So the question the children put to her: "Is it living or dead?" is not unreal because she thinks of language as susceptible to death, erasure; certainly imperiled and salvageable only by an effort of the will. She believes that if the bird in the hands of her visitors is dead the custodians are responsible for the corpse. For her a dead language is not only one no longer spoken or written, it is unyielding language content to admire its own paralysis. Like statist language, censored and censoring. Ruthless in its policing duties, it has no desire or purpose other than maintaining the free range of its own narcotic narcissism, its own exclusivity and dominance. However moribund, it is not without effect for it actively thwarts the intellect, stalls conscience, suppresses human potential. Unreceptive to interrogation, it cannot form or tolerate new ideas, shape other thoughts, tell another story, fill baffling silences. Official language smitheryed to sanction ignorance and preserve privilege is a suit of armor polished to shocking glitter, a husk from which the knight departed long ago. Yet there it is: dumb, predatory, sentimental. Exciting reverence in schoolchildren, providing shelter for despots, summoning false memories of stability, harmony among the public.

Notes on Illustrative Text #7

Inquiry into Life, 12th edition, by Sylvia S. Mader

These excerpts, and the prominent college-level biology textbook from which they are drawn, represent some of the challenges presented by complex writing in natural science, including discipline-specific terms (*covalent bond*, *plasma membrane*, *neurotransmitter*), everyday language used in specialized ways (*shell*, *channel*), abbreviations (H^+, *AChE*), and chains of cause-effect relationships that together describe sometimes elaborate processes. Although the figures the author, Sylvia S. Mader, refers to in the text are not included with these excerpts, students reading the larger work will have to integrate words, illustrations, and diagrams to make full sense of the ideas and concepts she describes. For these reasons and others, comprehension may be difficult for readers who have not had experience independently reading similar kinds of text and who lack a knowledge base in the subject. The author does employ a number of cohesive features to help readers understand the terminology and to link ideas. She repeats content words to let readers follow the flow of ideas; she sets up contrastive situations to illustrate the ideas (within, for example, the first and the third paragraphs below); and she uses transitional links ("In some synapses . . . In other synapses . . .") to help readers construct meaning.

Sample performance aligned with the Core Standards

Students discern the most important information in the description of covalent bonding and provide an accurate summary of the concept. [R-3]

Illustrative Text #7

from *Inquiry into Life*, 12th edition

Copyright © The McGraw-Hill Companies, Inc.

A **covalent bond** results when two atoms share electrons in such a way that each atom has an octet of electrons in the outer shell. In a hydrogen atom, the outer shell is complete when it contains two electrons. If hydrogen is in the presence of a strong electron acceptor, it gives up its electron to become a hydrogen ion (H^+). But if this is not possible, hydrogen can share with another atom and thereby have a completed outer shell. For example, one hydrogen atom will share with another hydrogen atom. Their two orbitals overlap, and the electrons are shared between them. Because they share the electron pair, each atom has a completed outer shell.

* * * * * * * *

The passage of salt (NaCl) across a plasma membrane is of primary importance to most cells. The chloride ion (Cl^-) usually crosses the plasma membrane because it is attracted by positively charged sodium ions (Na^+). First sodium ions are pumped across a membrane, and then chloride ions simply diffuse through channels that allow their passage.

As noted in Figure 4.2*a*, the genetic disorder cystic fibrosis results from a faulty chloride channel. Ordinarily, after chloride ions have passed though the membrane, sodium ions (Na^+) and water follow. In cystic fibrosis, Cl^- transport is reduced, and so is the flow of Na^+ and water.

* * * * * * * *

Once a neurotransmitter has been released into a synaptic cleft and has initiated a response, it is removed from the cleft. In some synapses, the postsynaptic membrane contains enzymes that rapidly inactivate the neurotransmitter. For example, the enzyme **acetylcholinesterase (AChE)** breaks down acetylcholine. In other synapses, the presynaptic membrane rapidly reabsorbs the neurotransmitter, possibly for repackaging in synaptic vesicles or for molecular breakdown. The short existence of neurotransmitters at a synapse prevents continuous stimulation (or inhibition) of postsynaptic membranes.

Notes on Illustrative Text #8

Sample business memo (ACT WorkKeys Reading for Information Test)

Though not a typical kind of reading in high school classrooms, the business communication, such as the one sampled here, is a form that career-ready students will need to be able to comprehend independently. This text, taken from ACT's WorkKeys Reading for Information Test, is challenging in large part because, like many such communications, it contains important, detailed information intended for a specialized audience. Structurally, the text offers little guidance on how it should be read. Potentially vital details appear throughout and are mingled with other details irrelevant to some readers (e.g., those without children). Even the paragraphing is somewhat inconsistent, especially between the first and second paragraphs. While the sentences are not particularly long and the language is not overly technical, the density of information and its lack of prioritization make this a complex text.

Sample performance aligned with the Core Standards

Students infer from the memo the conditions under which children who are under nineteen are not covered by the health plan. [R-1]

Illustrative Text #8

Sample business memo

WorkKeys Reading for Information Test has been reproduced with permission of ACT, Inc.

DETERMINING ELIGIBILITY FOR MEDICAL COVERAGE

All full-time employees of the company who work an average of at least 30 hours per week are eligible under this plan. Coverage begins on the first day of the month following the 30 days of active full-time employment. If employees enroll within 31 days of the date they are eligible, medical evidence of good health is not required. Temporary and part-time employees are not eligible. Employees are no longer eligible under this plan one month after the date they begin active duty in the armed forces of any country and continuing for the duration of their service.

If employees enroll their dependents within 31 days of the date they become eligible, medical evidence of good health is not required. If they do not, they will be required to submit evidence of good health for each dependent, at their expense, which is satisfactory to the company.

The following dependents are eligible under this plan: employees' spouses, employees' unmarried children under age 19, employees' unmarried dependent children under age 23 who are attending trade school, college, or university on a full-time basis, or employees' unmarried disabled children age 19 and over. Coverage ceases when spouses or children cease to be dependent upon employees for support. In the case of employees' spouses this is if they are legally separated or divorced. In the case of disabled children, this is when they are no longer disabled. Coverage will cease when dependents have served in the armed forces of any country for more than one month, or when maximum benefits have been paid.

Notes on Illustrative Text #9

FedViews, July 9, 2009, by Mary C. Daly
(The Federal Reserve Bank of San Francisco's Web site)

This text illustrates some of the difficulties posed by integrating information gained from words and graphics. This sort of challenge is common in writing designed to inform or explain, including writing in the workplace. The bullet point format used here means that the kind of explicit transitions between ideas typically found in prose are missing; readers will have to infer relationships between the points made by the author, Mary C. Daly, and synthesize the information into a coherent whole. Readers will furthermore have to analyze both the words and the graphics, integrate the information, and check to see whether each source of information supports the other. Daly also uses a great deal of specialized language; the terms *feedback loop*, *credit availability*, and *barriers to credit* all appear in just the first bullet point here.

Sample performance aligned with the Core Standards

Students synthesize information drawn from the text as well as the graphs in order to gain an overarching view of the economy on July 9, 2009. [R-11]

Illustrative Text #9

from FedViews, July 9, 2009

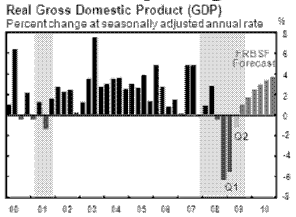
Reprinted from the Federal Reserve Bank of San Francisco's FedViews of July 9, 2009. The opinions expressed in this article do not necessarily reflect the views of the management of the Federal Reserve Bank of San Francisco, or of the Board of Governors of the Federal Reserve System.

Mary C. Daly, vice president and director of the Center for the Study of Innovation and Productivity at the Federal Reserve Bank of San Francisco, states her views on the current economy and the outlook.

- Financial markets are improving, and the crisis mode that has characterized the past year is subsiding. The adverse feedback loop, in which losses by banks and other lenders lead to tighter credit availability, which then leads to lower spending by households and businesses, has begun to slow. As such, investors' appetite for risk is returning, and some of the barriers to credit that have been constraining businesses and households are diminishing.
- Income from the federal fiscal stimulus, as well as some improvement in confidence, has helped stabilize consumer spending. Since consumer spending accounts for two-thirds of all economic activity, this is a key factor affecting our forecast of growth in the third quarter.
- The gradual nature of the recovery will put additional pressure on state and local budgets. Following a difficult 2009, especially in the West, most states began the 2010 fiscal year on July 1 with even larger budget gaps to solve.
- Still, many remain worried that large fiscal deficits will eventually be inflationary. However, a look at the empirical link between fiscal deficits and inflation in the United States shows no correlation between the two. Indeed, during the 1980s, when the United States was running large deficits, inflation was coming down.

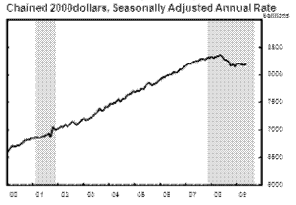
Modest recovery to begin in Q3

Real Gross Domestic Product (GDP)
Percent change at seasonally adjusted annual rate

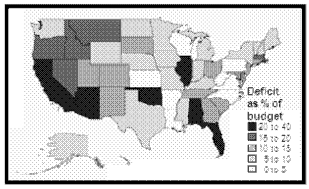


Consumers hanging on

Real Personal Consumption Expenditures
Chained 2000dollars, Seasonally Adjusted Annual Rate



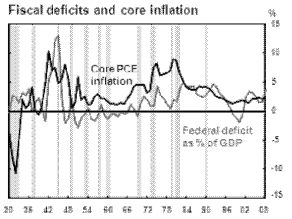
State budget gaps pervasive in 2009



27

No link between deficits and inflation

Fiscal deficits and core inflation



28

Notes on Illustrative Text #10

The front page of the *New York Times*, Web version, August 18, 2009, 9:03 a.m. ET

The challenge offered by this online text and others like it is very different from that offered by a complex continuous text in, say, the sciences. The brief passages are not conceptually difficult, the language is not technical or esoteric, and the sentences are not particularly complex. But these characteristics belie the complexity of the reading task. An online text of this kind requires readers to apply their print-reading skills in tandem with their knowledge of how to use online periodicals. The editors and designers have assigned levels of importance to individual stories and images, as measured by their size and position in the layout. The page itself uses words, numbers, icons, and other visual elements (e.g., line, color, and shape) to guide readers further. Headings in various colors direct readers to particular sections (OPINION, MARKETS, HEALTH), while links direct readers to particular stories ("Taliban Talks Are Key Issue in Afghan Vote"). Time markers ("3 minutes ago") help readers assess how new the information in a given story is. The text requires readers to make choices about which links to follow based on their understanding of how online text is typically structured and on a minimum of additional information (e.g., an icon of a camera, a drop-down menu in an ad).

Sample performance aligned with the Core Standards

Students select an article and use search terms and other features of the online text to research a specific aspect of the subject in more depth. [R-12]

Illustrative Text #10

The front page of the *New York Times*, Web version, August 18, 2009, 9:03 a.m. ET

From The New York Times, August 18, 2009. The New York Times: All rights reserved. Used by permission and protected by the Copyright Laws of the United States. The printing, copying, redistribution, or retransmission of the Material without express written permission is prohibited. http://www.nytimes.com

Sample of Works Consulted

I. College Readiness

A. Achieve, Inc. (2004). The American Diploma Project, *Ready or Not: Creating a High School Diploma that Counts*. Washington, DC: Achieve, Inc. (PDF)

B. Achieve, Inc. (2008) *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up*. Washington, DC: Achieve, Inc. (PDF)

C. ACT. (2009). *ACT College Ready English Standards*. Iowa City, IA: ACT. (PDF)

D. ACT. (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (PDF)

E. ACT. (2007). *Aligning Postsecondary Expectations and High School Practice: The Gap Defined (Policy Implications of the ACT National Curriculum Survey Results 2005-2006)*. Iowa City, IA: ACT. (PDF)

F. ACT. (2006). *Reading Between the Lines: What the ACT Reveals about College Readiness in Reading*. Iowa City, IA: ACT. (PDF)

G. ACT. (2006). *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: ACT. (PDF)

H. ACT. (2007). *Rigor at Risk: Reaffirming Quality in the High School Core Curriculum*. Iowa City, IA: ACT. (PDF)

I. College Board (2008) *AP English Language and Composition and English Literature and Composition Course Description*. New York, NY: College Board. (PDF)

J. College Board (2009) *AP European History Course Description*, New York, NY: College Board. (PDF)

K. College Board (2009) *AP World History Course Description*, New York, NY: College Board. (PDF)

L. College Board. (2006). *College Board Standards for College Success*. New York, NY: College Board. (PDF)

M. Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research.

N. Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (PDF)

O. Marzano, R.J. and Kendall, J.S. (2007). *The New Taxonomy of Educational Objectives*. Second Edition. Thousand Oaks, CA: Corwin Press.

P. Morreale, S. & Pearson, J. (2008) "Why communication education is important: The centrality of the discipline in the 21st century." *Communication Education*, 57(2), 224-240.

Q. Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Entrance Examination Board. (PDF)

R. *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis*. (Achieve).

II. Career Readiness

A. Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts*. Washington, DC: Achieve, Inc. (PDF)

B. ACT. (2007). *Aligning Postsecondary Expectations and High School Practice: The Gap Defined (Policy Implications of the ACT National Curriculum Survey Results 2005-2006)*. Iowa City, IA: ACT. (PDF)

C. ACT. (2006). *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: ACT. (PDF)

D. ACT. (2007). *Rigor at Risk: Reaffirming Quality in the High School Core Curriculum*. Iowa City, IA: ACT. (PDF)

E. Casner-Lotto, J., Rosenblum, E., and Wright, M., (2009). *The Ill-Prepared Workforce: Exploring the Challenges of Employer-Provided Workforce Readiness Training*. The Conference Board.

F. Florida American Diploma Project Survey Results. (Achieve).

G. Hawai'i Career Ready Study. (2007). Commissioned by the Hawai'i P-20 Initiative.(PDF)

H. *Missouri Career Prep Certificate Program Planning Guide*, Missouri Department of Elementary and Secondary Education. (PDF)

I. Morreale, S. & Pearson, J. (2008) "Why communication education is important: The centrality of the discipline in the 21st century." *Communication Education*, 57(2), 224-240.

J. National Alliance of Business. (2002).*The American Diploma Project Workplace Study*. Washington, DC.

K. Partnership for 21st Century Skills. (2009). *Framework for 21st Century Learning*. Tucson, AZ.

L. Qualifications and Curriculum Authority. (2007). *Functional Skills and Standards*. (PDF)

M. The Conference Board. (2008). *New Graduates' Workforce*

Readiness.

III. International Documents

A. **Alberta, Canada:** *English Language Arts Curriculum Outcomes*, 2003. (PDF)

B. **British Columbia, Canada:** *English Language Arts Integrated Resource Package, Prescribed Learning Outcomes*, 2007. (PDF)

C. **British Columbia:** English Literature 12, Integrated Resource Package, 2003. (PDF)

D. **England:** *English Programme of Study for Key stage 4*, 2007. (PDF)

E. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003. (PDF)

F. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (PDF)

G. **Hong Kong:** Hong Kong Examinations and Assessment Authority, 2007 HKCEE English Language, Recommended Texts for the School-Based Assessment Component. (PDF)

H. **Ireland:** *Leaving Certificate/English Syllabus for Higher Level and Ordinary Level.* (PDF)

I. **Ireland:** Prescribed Material for English in the Leaving Certificate Examination in 2009. (PDF)

J. **New South Wales:** *English Stage 6 Syllabus, 1999.* (PDF)

K. **New South Wales**: 2009-2012 HSC, Prescribed Area of Study, Electives and Texts. (PDF)

L. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007. (PDF)

M. **Singapore:** *English Language Syllabus 2001.* (PDF)

N. **Singapore:** O-Level Literature in English (Syllabus 2015), Prescribed Texts for 2009. (PDF)

O. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2006. (PDF)

P. **Victoria, Australia:** VCE English/ESL Text List 2008-2009, VCE Literature Text List 2008. (PDF)

Q. Achieve, Inc., National Governors Association, Council of Chief State School Officers. (2008). *Benchmarking for Success: Ensuring U.S. Students receive a World Class Education*. Washington, DC. (PDF)

R. Education Commission of the States. (2008). *From Competing to Leading: An International Benchmarking Blueprint*. Denver, CO. (PDF)

S. Education Commission of the States. (2009). *International Benchmarking Toolkit*. Denver, CO. (PDF)

T. Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills*. Paris, France. (PDF)

U. Organization for Economic Cooperation and Development. (2006). *PISA 2006: Science Competencies for Tomorrow's World, Vol. 1.* [see Chapter 6 for reading assessment results] Paris, France. (PDF)

IV. State and Other Standards Documents

A. **California:** *English-Language Arts Content Standards for California Public Schools.* California Department of Education (1997). (PDF)

B. **Florida:** *2006 Sunshine State Standards K-12 Reading and Language Arts.* Florida Department of Education (2006). (PDF)

C. **Georgia:** Georgia ELA Standards (K-12).

D. **Indiana**: Reading List, Grades 9-12. (PDF)

E. **Massachusetts**: *English Language Arts Curriculum Framework.* Massachusetts Department of Education (June 2001). (PDF)

F. **Minnesota:** *Minnesota Academic Standards, Language Arts (K-12),* (2003). (PDF)

G. **Texas:** *Texas College Readiness Standards*, (2008). (PDF)

H. National Council of Teachers of English and the International Reading Association. (1996). *Standards for the English Language Arts.* (PDF)

I. U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009*. Washington, DC: National Assessment Governing Board. (PDF)

J. U.S. Dept. of Education. (2007). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (MS Word Document)

V. Disciplinary Literacy Research

A. Carnegie Council on Advancing Adolescent Literacy. (2010). *Time to act: An agenda for advancing adolescent literacy for college and career success*. New York, NY: Carnegie Corporation of New York. (PDF)

B. Fang, Z., & Schleppegrell, M. J. (2008). *Reading in secondary content areas.* Ann Arbor: University of Michigan Press.

C. Lee, C.D., Spratley, A. (2010). *Reading in the disciplines: The challenges of adolescent literacy*. New York, NY: Carnegie Corporation of New York. (PDF)

D. Moje, E. B., Young, J. P., Readence, J. E., & Moore, D. W. (2000). Reinventing adolescent literacy for new times: Perennial and millennial issues. *Journal of Adolescent and Adult Literacy, 43*, 400–410.

E. Schleppegrell, M. J. (2004). *The language of schooling: A functional linguistics perspective.* Mahwah, NJ: Lawrence Erlbaum Associates.

F. Shanahan, T., & Shanahan, C. (2008). Teaching disciplinary literacy to adolescents: Rethinking content-area literacy. *Harvard Educational Review, 78*, 40–59.

College and Career Readiness Standards for Mathematics

Draft for Review and Comment

September 21, 2009

DRAFT

Contents 1

Introduction 2-4

How Evidence Informed Decisions in Drafting the Standards 5, 6

College and Career Readiness Standards for Mathematics 7-19

- Mathematical Practice 8
- Number 9
- Quantity 10
- Expressions 11
- Equations 12
- Functions 13
- Modeling 14
- Shape 15
- Coordinates 16
- Probability 17
- Statistics 18
- Example Tasks online at www.corestandards.org

Sample of Works Consulted 19-22

DRAFT

Introduction

The *College and Career Readiness Standards for Mathematics* consist of three interconnected parts: a Standard for Mathematical Practice, ten Standards for Mathematical Content, and a set of Example Tasks.

The Standard for Mathematical Practice has six Core Practices that describe the way proficient students approach mathematics. Proficient students attend to precision, construct viable arguments, make sense of complex problems and persevere in solving them, look for hidden structure, note regularity in repeated reasoning, and use technology intelligently. This approach to mathematics is an essential part of being ready for college and career.

The Standards for Mathematical Content form the backbone of this document. Each of these ten standards consists of Core Concepts, Core Skills, and a description of the student's Coherent Understanding. Students who encounter the subject with a focus on coherence will be better able to learn more mathematics at a deeper level and be better able to access and apply the mathematics they know. The ten Standards for Mathematical Content pull together topics previously studied and look ahead toward topics in further coursework and training programs.

The Standards for Mathematical Content are designed to draw greater attention to powerful organizing principles in mathematics, such as functional relationships or the laws of arithmetic. They also allow important distinctions to be made more clearly, such as that between Expressions and Equations. And they surface the deep connections that often underlie mathematical coherence, such as the blending of algebra with geometry represented by Coordinates. These ten are not categories or buckets of topics to cover; they are standards. They describe the coherence students need and deserve as they go forward to their mathematical futures.

The third component of the *College and Career Readiness Standards for Mathematics* is a Web-based collection of Example Tasks that exemplifies the variety of performances required. High standards demand that students *use* their knowledge, skills and good practices to solve problems from a variety of contexts, both within mathematics and from the world outside. Example Tasks exemplify the range and variety of use that is expected. Teachers and designers of curriculum and assessment will find in the collection of examples a guide to what these standards mean. Over time, the collection of tasks will grow.

Together, these three components establish an evidence-based standard for college and career readiness. The *College and Career Readiness Standards for Mathematics* have been created with attention to the expectations of the highest achieving countries. They have focus and depth, emphasizing the understanding of and connections among topics that are most important for success regardless of a student's pathway after reaching these standards.

DRAFT

A primary goal of developing these standards is to enable students to achieve *mathematical proficiency* (see sidebar). Students are expected to understand the knowledge described in the Core Concepts and in the Coherent Understandings at a depth that enables them to reason with that knowledge—to analyze, interpret and evaluate mathematical problems, make deductions, and justify results. The Core Skills are meant to be used strategically and adaptively to solve problems. Students' knowledge and skills come to life and take their value when melded with the ways they approach mathematics—as described by the Core Practices.

The specific verbs used to describe concepts and skills in these standards are not meant to limit or indicate levels of any taxonomy. Although using verbs to indicate levels of depth has been a common practice in this country's standards writing, high performing nations do not use verbs in this way. They describe depth and practices first in separate sections of their syllabi. We have adopted the high performing countries' practice of focusing on a clear statement of what mathematics should be learned when writing standards for knowledge and skills.

Instruction, curriculum and assessment designed to achieve these standards should range over all strands of proficiency in *Adding It Up*, all depths of knowledge in Norman L. Webb's Depth of Knowledge taxonomy, all levels of Bloom's Taxonomy, and all levels of cognitive demand. In the Core Skills and Core Practices we have sometimes used terms like "explore" to indicate a lighter treatment with a goal of awareness and experience rather than proficiency. We have used Example Tasks to show the depth of knowledge and deployment of skills expected.

From *Adding it up: Helping children learn mathematics* (National Research Council, 2001, p. 116):

Recognizing that no term captures completely all aspects of expertise, competence, knowledge, and facility in mathematics, we have chosen mathematical proficiency to capture what we believe is necessary for anyone to learn mathematics successfully. Mathematical proficiency, as we see it, has five components, or strands:

- conceptual understanding—comprehension of mathematical concepts, operations, and relations
- procedural fluency—skill in carrying out procedures flexibly, accurately, efficiently, and appropriately
- strategic competence—ability to formulate, represent, and solve mathematical problems
- adaptive reasoning—capacity for logical thought, reflection, explanation, and justification
- productive disposition—habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy.

These standards are measurable; that is, they are observable and verifiable through the broad spectrum of student performances that may be assessed during classroom observation, school-based examinations and large-scale testing. The *College and Career Readiness Standards for Mathematics* can guide the development of assessment frameworks that distribute the assessment responsibilities across multiple levels of the educational system: state, district, school and teacher.

Students reaching these levels will be prepared for non-remedial college mathematics courses and will be prepared for training programs for career-level jobs; however, the *College and Career Readiness Standards for Mathematics* should not be construed as grade twelve exit standards. Students interested in STEM fields, and those who wish to go beyond for other reasons, will need to reach these standards before their senior year in order to have time to include additional mathematics. A number of pathways for advanced learning are possible and may be integrated throughout the high school experience and beyond.

DRAFT

The Common Core State Standards Initiative

The *College and Career Readiness Standards for Mathematics* will anchor the next phase of the Common Core State Standards Initiative: development of K–12 Mathematics Standards. Those K–12 Standards are in turn expected to guide the development of a next generation of assessments, developed collaboratively by multiple states. The K–12 Mathematics Standards will serve as a guide and tool for aligning instruction, curriculum, assessment, teacher supports, and systems of accountability. To ensure alignment, the Standard for Mathematical Practice, the Standards for Mathematical Content, and the Example Tasks should all be taken into account.

Overview of the Mathematical Practice Standard

Attend to precision.
Construct viable arguments.
Make sense of complex problems and persevere in solving them.
Look for structure.
Look for and express regularity in repeated reasoning.
Make strategic decisions about the use of technological tools.

Overview of the Mathematical Content Standards

Number. Procedural fluency in operations with real numbers and strategic competence in approximation are grounded in an understanding of place value. The rules of arithmetic govern operations on numbers and extend to operations in algebra.

Quantity. A quantity is an attribute of an object or phenomenon that can be specified using a number and a unit, such as 2.7 centimeters, 42 questions or 28 miles per gallon.

Expressions. Expressions use numbers, variables and operations to describe computations. The rules of arithmetic, the use of parentheses and the conventions about order of operations assure that the computation has a well-determined value.

Equations. An equation is a statement that two expressions are equal. Solutions to an equation are the values of the variables in it that make it true.

Functions. Functions model situations where one quantity determines another. Because nature and society are full of dependencies, functions are important tools in the construction of mathematical models.

Modeling. Modeling uses mathematics to help us make sense of the real world—to understand quantitative relationships, make predictions, and propose solutions.

Shape. From only a few axioms, the deductive method of Euclid generates a rich body of theorems about geometric objects, their attributes and relationships.

Coordinates. Applying a coordinate system to Euclidean space connects algebra and geometry, resulting in powerful methods of analysis and problem solving.

Probability. Probability assesses the likelihood of an event in a situation that involves randomness. It quantifies the degree of certainty that an event will happen as a number from 0 through 1.

Statistics. Decisions or predictions are often based on data—numbers in context. These decisions or predictions would be easy if the data always sent a clear message, but the message is often obscured by variability in the data.

DRAFT

How Evidence Informed Decisions in Drafting the Standards

The Common Core State Standards Initiative builds on a generation of standards efforts led by states and national organizations. On behalf of the states, we have taken a step toward the next generation of standards that are aligned to college- and career-ready expectations and are internationally benchmarked. These standards are grounded in evidence from many sources that shows that the next generation of standards in mathematics must be focused on deeper, more thorough understanding of more fundamental mathematical ideas and higher mastery of these fewer, more useful skills.

The evidence that supports this new direction comes from a variety of sources. International comparisons show that high performing countries focus on fewer topics and that the U.S. curriculum is "a mile wide and an inch deep." Surveys of college faculty show the need to shift away from high school courses that merely survey advanced topics, toward courses that concentrate on developing an understanding and mastery of ideas and skills that are at the core of advanced mathematics. Reviews of data on student performance show the large majority of U.S. students are not mastering the mile wide list of topics that teachers cover.

The evidence tells us that in high performing countries like Singapore, the gap between what is taught and what is learned is relatively smaller than in Malaysia or the U.S. states. Malaysia's standards are higher than Singapore's, but their performance is much lower. One could interpret the narrower gap in Singapore as evidence that they actually use their standards to manage instruction; that is, Singapore's standards were set within the reach of hard work for their system and their population. Singapore's Ministry of Education flags its webpage with the motto, "Teach Less, Learn More." We accepted the challenge of writing standards that could work that way for U.S. teachers and students: By providing focus and coherence, we could enable more learning to take place at all levels.

However, a set of standards cannot be simplistically "derived" from any body of evidence. It is more accurate to say that we used evidence to inform our decisions. A few examples will illustrate how this was done.

For example, systems of linear equations are covered by all states, yet students perform surprisingly poorly on this topic when assessed by ACT. We determined that systems of linear equations have high coherence value, mathematically; that this topic is included by all high performing nations; and that it has moderately high value to college faculty. Result: We included it in our standards.

A different and more complex pattern of evidence appeared with families of functions. Again we found that students performed poorly on problems related to many advanced functions (trigonometric, logarithmic, quadratic, exponential, and so on). Again we found that a number of states cover them, even though college faculty rated them lower in value. High performing countries include this material, but with different degrees of demand. We decided that we had to carve a careful line through these topics so that limited teaching resources could focus where most important. We decided that students should

DRAFT

develop deep understanding and mastery of linear and exponential functions. They should also have familiarity with other families of functions, and apply their algebraic, modeling and problem solving skills to them—but not develop in-depth technical mastery and understanding. Thus we defined two distinct levels of attention and identified which families of functions got which level of attention.

Why were exponential functions selected for intensive focus in the Functions standard instead of, say, quadratic functions? What tipped the balance was the high coherence value of exponential functions in supporting modeling and their wide utility in work and life. Quadratic functions were also judged to be well supported by expectations defined under Expressions and Equations.

These examples indicate the kind of reasoning, informed by evidence, that it takes to design standards aligned to the demands of college and career readiness in a global economy. We considered inclusion in international standards, requirements of college and the workplace, surveys of college faculty and the business community, and other sources of evidence. As we navigated these sometimes conflicting signals, we always remained aware of the finiteness of instructional resources and the need for deep mathematical coherence in the standards.

At the end of this document, there is a listing of a number of sources that played a role in the deliberations described above and more generally throughout the process to inform our decisions. A hyperlinked version of the bibliography can be found online at www.corestandards.org.

DRAFT

DRAFT

Mathematical Practice

Proficient students expect mathematics to make sense. They take an active stance in solving mathematical problems. When faced with a non-routine problem, they have the courage to plunge in and try something, and they have the procedural and conceptual tools to carry through. They are experimenters and inventors, and can adapt known strategies to new problems. They think strategically.

Students who engage in these practices discover ideas and gain insights that spur them to pursue mathematics beyond the classroom walls. They learn that effort counts in mathematical achievement.[a] These are practices that expert mathematical thinkers encourage in apprentices. Encouraging these practices in our students should be as much a goal of the mathematics curriculum as is teaching specific content topics and procedures.[b] Taken together with the Standards for Mathematical Content, they support productive entry into college courses or career pathways.

Core Practices · Students can and do:

1 Attend to precision.

Mathematically proficient students organize their own ideas in a way that can be communicated precisely to others, and they analyze and evaluate others' mathematical thinking and strategies noting the assumptions made. They clarify definitions. They state the meaning of the symbols they choose, are careful about specifying units of measure and labeling axes, and express their answers with an appropriate degree of precision. Rather than saying, "let *v* be speed and let *t* be time," they would say "let *v* be the speed in meters per second and let *t* be the elapsed time in seconds from a given starting time." They recognize that when someone says the population of the United States in June 2008 was 304,059,724, the last few digits indicate unwarranted precision.

2 Construct viable arguments.

Mathematically proficient students understand and use stated assumptions, definitions and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They break things down into cases and can recognize and use counterexamples. They use logic to justify their conclusions, communicate them to others and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose.

3 Make sense of complex problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They consider analogous problems, try special cases and work on simpler forms. They evaluate their progress and change course if necessary. They try putting algebraic expressions into different forms or try changing the viewing window on their calculator to get the information they need. They look for correspondences between equations, verbal descriptions, tables, and graphs. They draw diagrams of relationships, graph data, search for regularity and trends, and construct mathematical models. They check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?"

4 Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern. For example, in $x^2 + 5x + 6$ they can see the 5 as $2 + 3$ and the 6 as 2×3. They recognize the significance of an existing line in a geometric figure and can add an auxiliary line to make the solution of a problem clear. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects. For example, by seeing $5 - 3(x - y)^2$ as 5 minus a positive number times a square, they see that it cannot be more than 5 for any real numbers x and y.[b]

5 Look for and express regularity in repeated reasoning.

Mathematically proficient students pay attention to repeated calculations as they carry them out, and look both for general algorithms and for shortcuts. For example, by paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, they might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel in the expansions of $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ leads to the general formula for the sum of a geometric series. As they work through the solution to a problem, proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.[b]

6 Make strategic decisions about the use of technological tools.

Mathematically proficient students consider the available tools when solving a mathematical problem, whether pencil and paper, ruler, protractor, graphing calculator, spreadsheet, computer algebra system, statistical package, or dynamic geometry software. They are familiar enough with all of these tools to make sound decisions about when each might be helpful. They use mathematical understanding and estimation strategically, attending to levels of precision, to ensure appropriate levels of approximation and to detect possible errors. They are able to use these tools to explore and deepen their understanding of concepts.

(a) For the importance of students' beliefs about effort, see the National Mathematics Advisory Panel's Report of the Task Group on Learning Processes, p. 4-10 (2008). (b) Cuoco, A., Goldenberg, E. P., and Mark, J., *Journal of Mathematical Behavior*, 15 (4), 375-402, 1996; *Focus in High School Mathematics*. Reston, VA: NCTM, in press; Harel, G., What is Mathematics? A Pedagogical Answer to a Philosophical Question. In R. B. Gold & R. Simons (Eds.), *Current Issues in the Philosophy of Mathematics From the Perspective of Mathematicians*, Mathematical Association of America, 2008.

DRAFT

Number

Core Concepts · Students understand that:

A The real numbers include the rational numbers and are in one-to-one correspondence with the points on the number line.

B Quantities can be compared using division, yielding rates and ratios.

C A fraction can represent the result of dividing the numerator by the denominator; equivalent fractions have the same value.

D Place value and the rules of arithmetic form the foundation for efficient algorithms.

A Coherent Understanding of Number. Procedural fluency in operations with real numbers and strategic competence in approximation are grounded in an understanding of place value. The rules of arithmetic govern operations on numbers and extend to operations in algebra:

- Numbers can be added in any order with any grouping and multiplied in any order with any grouping.
- Adding 0 and multiplying by 1 both leave a number unchanged.
- All numbers have additive inverses, and all numbers except zero have multiplicative inverses.
- Multiplication distributes over addition.

Subtraction and division are defined in terms of addition and multiplication, so are also governed by these rules.

The place value system bundles units into 10s, then 10s into 100s, and so on, providing an efficient way to name large numbers. Subdividing in a similar way extends this to the decimal system, which provides an address system for locating all real numbers on the number line with arbitrarily high accuracy. Place value is the basis for efficient algorithms, reducing much computation to single-digit arithmetic. Mental computation strategies also make opportunistic use of the rules of arithmetic, as when the product $5 \times 177 \times 2$ is computed at a glance to obtain 1770, rather than methodically working from left to right.

An estimate may be more appropriate than an exact value, for example, when you want to know the number of calories in a meal. Often a result is reported using fewer digits than were calculated. A mature number sense includes having rules of thumb about how much accuracy is appropriate and understanding that accuracy to more than a few decimal places often takes substantial effort. Estimation and approximation are also useful in checking calculations.

Rational numbers represented as fractions can be located on the number line by seeing them as numbers expressed in different units; for example, 3/5 is 3 units, where each unit is 1/5. However, rational numbers do not fill out the number line. There are also irrational numbers, such as π or $\sqrt{2}$. Each point on the number line then corresponds to a real number that is either rational or irrational.

Connections to Expressions, Functions and Coordinates. The rules of arithmetic govern the manipulations of expressions and functions. Two perpendicular number lines define the coordinate plane.

Core Skills · Students can and do:

1 Compare numbers and make sense of their magnitude.

Include positive and negative numbers expressed as fractions, decimals, powers, and roots. Limit to square and cube roots. Include very large and very small numbers and the use of scientific notation.

2 Know when and how to use standard algorithms, and perform them flexibly, accurately and efficiently.*

3 Use mental strategies and technology to formulate, represent and solve problems.**

4 Solve multi-step problems involving fractions and percentages.

Include situations such as simple interest, tax, markups/markdowns, gratuities and commissions, fees, percent increase or decrease, percent error, expressing rent as a percentage of take-home pay, and so on.

5 Use estimation and approximation to solve problems.

Include evaluating answers for their reasonableness, detecting errors, and giving answers to an appropriate level of precision.

* This aligns with the concept of procedural fluency as in the National Research Council report *Adding it up: Helping children learn mathematics*. Specifically, "*Procedural fluency* refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently" (p. 121).

** This aligns with the concept of strategic competence as described in *Adding it up*. "Strategic competence refers to the ability to formulate mathematical problems, represent them, and solve them" (p. 124).

DRAFT

Quantity

Core Concepts · Students understand that:

A The value of a quantity is not specified unless the units are named or understood from the context.

B Quantities can be added and subtracted only when they are of the same type (length, area, speed, etc.).

C Quantities can be multiplied or divided to create new types of quantities, called derived quantities.

A Coherent Understanding of Quantity. A quantity is an attribute of an object or phenomenon that can be specified using a number and a unit, such as 2.7 centimeters, 42 questions or 28 miles per gallon.

The length of a football field and the speed of light are both quantities. If we choose units of miles per second, then the speed of light has a value of approximately 186,000 miles per second. But the speed of light need not be expressed in miles per second; it may be approximated by 3×10^8 meters per second or in any other unit of speed. Bare numerical values such as 186,000 do not describe quantities unless they are paired with units.

Speed (distance divided by time), rectangular area (length multiplied by length), density (mass divided by volume), and population density (number of people divided by land area) are examples of derived quantities, obtained by multiplying or dividing quantities.

It can make sense to add two quantities, such as when a child 51 inches tall grows 3 inches to become 54 inches tall. To be added or subtracted, quantities must be of the same type (length, area, speed, etc.); to add or subtract their values, the quantities must be expressed in the same units. Converting quantities to have the same units is like converting fractions to have a common denominator before adding or subtracting. But, even when quantities have the same units it does not always make sense to add them. For example, if a wooded park with 300 trees per acre is next to a field with 30 trees per acre, they do not have 330 trees per acre.

Doing algebra with units in a calculation reveals the units of the answer, and can help reveal a mistake if, for example, the answer comes out to be a distance when it should be a speed.

Connections to Number, Expressions, Equations, Functions, Modeling and Statistics. Operations described under Number and Expressions govern the operations one performs on quantities, including the units involved. Quantity is an integral part of any application of mathematics, and has connections to solving problems using data, equations, functions and modeling.

Core Skills · Students can and do:

1 Know when and how to convert units in computations.

Include the addition and subtraction of quantities of the same type expressed in different units; averaging data given in mixed units; converting units for derived quantities such as density and speed.

2 Use and interpret quantities and units correctly in algebraic formulas.

Include specifying units when defining variables and attending to units when writing expressions and equations.

3 Use and interpret quantities and units correctly in graphs and data displays.

Include function graphs, data tables, scatterplots and other visual displays of dimensioned data.

4 Use units as a way to understand problems and to guide the solution of multi-step problems.

Include examples such as acceleration; currency conversions; people-hours; social science measures, such as deaths per 100,000; and general rates, such as points per game.

DRAFT

Expressions

Core Concepts · Students understand that:

A Expressions are constructions built up from numbers, variables, and operations, which have a numerical value when each variable is replaced with a number.

B Complex expressions are made up of simpler expressions.

C The rules of arithmetic can be applied to transform an expression without changing its value.

D Rewriting expressions in equivalent forms serves a purpose in solving problems.

A Coherent Understanding of Expressions. Expressions use numbers, variables and operations to describe computations. The rules of arithmetic, the use of parentheses and the conventions about order of operations assure that the computation has a well-determined value.

Reading an expression with comprehension involves analysis of its underlying structure, which may suggest a different but equivalent way of writing it that exhibits some different aspect of its meaning. For example, $p + 0.05p$ can be interpreted as the addition of a 5% tax to a price p. But rewriting $p + 0.05p$ as $1.05p$ shows that adding a tax is the same as multiplying by a constant factor.

Algebraic manipulations are based on the conventions of algebraic notation and the rules of arithmetic. Heuristic mnemonic devices are not a substitute for procedural fluency. For example, factoring, expanding, collecting like terms, the rules for interpreting minus signs next to parenthetical sums, and adding fractions with a common denominator are all instances of the distributive law; the definitions for negative and rational exponents are based on the extension of the exponent laws for positive integers. The laws of exponents connect multiplication of numbers to addition of exponents and thus express the deep relationship between addition and multiplication captured by the parallel nature of the rules of arithmetic for these operations.

Complex expressions are made up of simpler expressions using arithmetic operations and substitution. When simple expressions within more complex expressions are treated as single quantities, or chunks, the underlying structure of the larger expression may be more evident.

Connections to Equations and Functions. Setting expressions equal to each other leads to equations. Expressions can define functions of the variables that appear in them, with equivalent expressions defining the same function.

Core Skills · Students can and do:

1 See structure in expressions.

For example, recognize: that the expressions $x^4 - y^4$ and $(x+y)^2 - (x-y)^2$ are differences of squares; that there are different ways to rewrite the latter expression, e.g., by expanding and collecting like terms or by factoring as a difference of squares; that p is a common factor in $p + 0.025p$; that an expression in the form $(x-3)^2 + 14$ reveals its minimum value.

2 Manipulate simple expressions.

Show procedural fluency in the following cases: factoring out common terms; factoring expressions with quadratic structure; writing in standard form sums, differences, and products of polynomials. Include completing the square and rewriting in standard form sums, differences, products, and quotients of simple rational expressions; rewriting expressions with negative exponents and those involving square or cube roots of a single term involving exponents.

3 Define variables and write an expression to represent a quantity in a problem.

Include contextual problems.

4 Interpret an expression that represents a quantity in terms of the context.

Include interpreting parts of an expression, such as terms, factors and coefficients.

DRAFT

Equations

Core Concepts · Students understand that:

A An equation is a statement that two expressions are equal.

B The solutions of an equation are the values of the variables that make the resulting numerical statement true.

C The steps in solving an equation are guided by understanding and justified by logical reasoning.

D Equations not solvable in one number system may have solutions in a larger number system.

A Coherent Understanding of Equations. An equation is a statement that two expressions are equal. Solutions to an equation are the values of the variables in it that make it true. If the equation is true for all values of the variables, then we call it an identity; identities are often discovered by manipulating one expression into another.

The solutions of an equation in one variable form a set of numbers; the solutions of an equation in two variables form a set of ordered pairs, which can be graphed in the plane. Equations can be combined into systems to be solved simultaneously.

An equation can be solved by successively transforming it into one or more simpler equations. The process is governed by deductions based on the properties of equality. For example, one can add the same constant to both sides without changing the solutions, but squaring both sides might lead to extraneous solutions. Strategic competence in solving includes looking ahead for productive manipulations and anticipating the nature and number of solutions.

Some equations have no solutions in a given number system, stimulating the formation of expanded number systems (integers, rational numbers, real numbers and complex numbers).

A formula is a type of equation. The same solution techniques used to solve equations can be used to rearrange formulas. For example, the formula for the area of a trapezoid, $A = \left(\frac{b_1+b_2}{2}\right)h$, can be solved for h using the same deductive process.

Inequalities can be solved in much the same way as equations. Many, but not all, of the properties of equality extend to the solution of inequalities.

Connections to Functions, Coordinates, and Modeling. Equations in two variables may define functions. Asking when two functions have the same value leads to an equation; graphing the two functions allows for the approximate solution of the equation. Equations of lines involve coordinates, and converting verbal descriptions to equations is an essential skill in modeling.

Core Skills · Students can and do:

1 Understand a problem and formulate an equation to solve it.

Extend to inequalities and systems.

2 Solve equations in one variable using manipulations guided by the rules of arithmetic and the properties of equality.

Solve linear equations with procedural fluency. For quadratic equations, include solution by inspection, by factoring, or by using the quadratic formula. Understand that the quadratic formula comes from completing the square. Include simple absolute value equations solvable by direct inspection and by understanding the interpretation of absolute value as distance.

3 Rearrange formulas to isolate a quantity of interest.

Exclude cases that require extraction of roots or inverse functions.

4 Solve systems of equations.

Focus on pairs of simultaneous linear equations in two variables. Include algebraic techniques, graphical techniques and solving by inspection.

5 Solve linear inequalities in one variable and graph the solution set on a number line.

Emphasize solving the associated equality and determining on which side of the solution of the associated equation the solutions to the inequality lie.

6 Graph the solution set of a linear inequality in two variables on the coordinate plane.

Emphasize graphing the associated equation, using a dashed or solid line as appropriate and shading to indicate the half-plane on which the solutions to the inequality lie.

DRAFT

Functions

Core Concepts · Students understand that:

A A function is a rule, often defined by an expression, that assigns a unique output for every input.

B The graph of a function f is a set of ordered pairs $(x, f(x))$ in the coordinate plane.

C Functions model situations where one quantity determines another.

D Common functions occur in families where each member describes a similar type of dependence.

A Coherent Understanding of Functions. Functions model situations where one quantity determines another. For example, the return on $10,000 invested at an annualized percentage rate of 4.25% is a function of the length of time the money is invested. Because nature and society are full of dependencies between quantities, functions are important tools in the construction of mathematical models.

In school mathematics, functions usually have numerical inputs and outputs and are often defined by an algebraic expression. For example, the time in hours it takes for a plane to fly 1000 miles is a function of the plane's average ground speed in miles per hour, v; the rule $T(v) = 1000/v$ expresses this relationship algebraically and defines a function whose name is T.

The set of possible inputs to a function is called its domain. We often infer the domain to be all inputs for which the expression defining a function has a value, or for which the function makes sense in a given context. The graph of a function is a useful way of visualizing the relationship the function models, and manipulating the expression for a function can throw light on the function's properties.

Two important families of functions characterized by laws of growth are linear functions, which grow at a constant rate, and exponential functions, which grow at a constant percent rate. Linear functions with an initial value of zero describe proportional relationships.

Connections to Expressions, Equations, Modeling and Coordinates. Determining an output value for a particular input involves evaluating an expression; finding inputs that yield a given output involves solving an equation. The graph of a function f is the same as the solution set of the equation $y = f(x)$. Questions about when two functions have the same value lead to equations, whose solutions can be visualized from the intersection of the graphs. Since functions describe relationships between quantities, they are frequently used in modeling. Sometimes functions are defined by a recursive process, which can be modeled effectively using a spreadsheet or other technology.

Core Skills · Students can and do:

1 Recognize proportional relationships and solve problems involving rates and ratios.

Include being able to express proportional relationships as functions.

2 Describe the qualitative behavior of common types of functions using graphs and tables.

Identify: intercepts; intervals where the function is increasing, decreasing, positive or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. Use technology to explore the effects of parameter changes on the graphs of linear, power, quadratic, polynomial, simple rational, exponential, logarithmic, sine and cosine, absolute value and step functions.

3 Analyze functions using symbolic manipulation.

Include slope-intercept and point-slope form of linear functions; vertex form of quadratic functions to identify symmetry and find maximums and minimums; factored form to find zeros. Use manipulations as described under Expressions.

4 Use the families of linear and exponential functions to solve problems.

For linear functions $f(x) = mx + b$, understand b as the intercept or initial value and m as the slope or rate of change. For exponential functions $f(x) = a \cdot b^x$, understand a as the intercept or initial value and b as the growth factor.

5 Find and interpret rates of change.

Compute the rate of change of linear functions and make qualitative observations about how the rate of change varies for nonlinear functions.

DRAFT

Modeling

Core Concepts · Students understand that:

A Mathematical models involve choices and assumptions that abstract key features from situations to help us solve problems.

B Even very simple models can be useful.

A Coherent Understanding of Modeling. Modeling uses mathematics to help us make sense of the real world—to understand quantitative relationships, make predictions, and propose solutions.

A model can be very simple, such as a geometric shape to describe a physical object like a coin. Even so simple a model involves making choices. It is up to us whether to model the solid nature of the coin with a three-dimensional cylinder, or whether a two-dimensional disk works well enough for our purposes. For some purposes, we might even choose to adjust the right circular cylinder to model more closely the way the coin deviates from the cylinder.

In any given situation, the model we devise depends on a number of factors: How precise an answer do we want or need? What aspects of the situation do we most need to understand, control, or optimize? What resources of time and tools do we have? The range of models we can create and analyze is constrained as well by the limitations of our mathematical and technical skills. For example, modeling a physical object, a delivery route, a production schedule, or a comparison of loan amortizations each requires different sets of tools. Networks, spreadsheets and algebra are powerful tools for understanding and solving problems drawn from different types of real-world situations. One of the insights provided by mathematical modeling is that essentially the same mathematical structure might model seemingly different situations.

The basic modeling cycle is one of (1) identifying the key features of a situation, (2) creating geometric, algebraic or statistical objects that describe key features of the situation, (3) analyzing and performing operations on these objects to draw conclusions and (4) interpreting the results of the mathematics in terms of the original situation. Choices and assumptions are present throughout this cycle.

Connections to Quantity, Equations, Functions, Shape, Coordinates and Statistics. Modeling makes use of shape, data, graphs, equations and functions to represent real-world quantities and situations.

Core Skills · Students can and do:

1 Model numerical situations.

Include readily applying the four basic operations in combination to solve multi-step quantitative problems with dimensioned quantities; making estimates to introduce numbers into a situation and get problems started; recognizing proportional or near-proportional relationships and analyzing them using characteristic rates and ratios.

2 Model physical objects with geometric shapes.

Include common objects that can reasonably be idealized as two- and three-dimensional geometric shapes. Identify the ways in which the actual shape varies from the idealized geometric model.

3 Model situations with equations and inequalities.

Include situations well described by a linear inequality in two variables or a system of linear inequalities defining a region in the plane.

4 Model situations with common functions.

Include situations well described by linear, quadratic or exponential functions; and situations that can be well described by inverse variation ($f(x) = k/x$). Include identifying a family of functions that models features of a problem, and identifying a particular function of that family and adjusting it to fit by changing parameters. Understand the recursive nature of situations modeled by linear and exponential functions.

5 Model situations using probability and statistics.

Include using simulations to model probabilistic situations; describing the shape of a distribution of values and summarizing a distribution with measures of center and variability; modeling a bivariate relationship using a trend line or a regression line.

6 Interpret the results of applying a model and compare models for a particular situation.

Include realizing that models seldom fit exactly and so there can be error; identifying simple sources of error and being careful not to over-interpret models. Include recognizing that there can be many models that relate to a situation, that they can capture different aspects of the situation, that they can be simpler or more complex, and that they can have a better or worse fit to the situation and the questions being asked.

DRAFT

Shape

Core Concepts · Students understand that:

A Shapes and their parts, attributes, and measurements can be analyzed deductively.*

B Congruence, similarity, and symmetry can be analyzed using transformations.

C Mathematical shapes model the physical world, resulting in practical applications of geometry.

D Right triangles and the Pythagorean theorem are central to geometry and its applications, including trigonometry.

A Coherent Understanding of Shape. From only a few axioms, the deductive method of Euclid generates a rich body of theorems about geometric objects, their attributes and relationships. Once understood, those attributes and relationships can be applied in diverse practical situations—interpreting a schematic drawing, estimating the amount of wood needed to frame a sloping roof, rendering computer graphics, or designing a sewing pattern for the most efficient use of material.

Understanding the attributes of geometric objects often relies on measurement: a circle is a set of points in a plane at a fixed distance from a point; a cube is bounded by six squares of equal area; when two parallel lines are crossed by a transversal, pairs of corresponding angles are congruent.

The concepts of congruence, similarity and symmetry can be united under the concept of geometric transformation. Reflections and rotations each explain a particular type of symmetry, and the symmetries of an object offer insight into its attributes—as when the reflective symmetry of an isosceles triangle assures that its base angles are congruent. Applying a scale transformation to a geometric figure yields a similar figure. The transformation preserves angle measure, and lengths are related by a constant of proportionality. If the constant of proportionality is one, distances are also preserved (so the transformation is a rigid transformation) and the figures are congruent.

The definitions of sine, cosine and tangent for acute angles are founded on right triangle similarity, and, with the Pythagorean theorem, are fundamental in many practical and theoretical situations.

Connections to Coordinates, Functions and Modeling. The Pythagorean theorem is a key link between geometry, measurement and distance in the coordinate plane. Parameter changes in families of functions can be interpreted as transformations applied to their graphs and those functions, as well as geometric objects in their own right, can be used to model contextual situations.

*In this document, deductive analysis aligns with the notion of adaptive reasoning as defined in *Adding it Up*, and includes empirical exploration, informal justification, and formal proof.

Core Skills · Students can and do:

1 Use multiple geometric properties to solve problems involving geometric figures.

Properties include: measures of interior angles of a triangle sum to 180°; vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; measures of supplementary angles sum to 180°; two lines parallel to a third are parallel to each other; points on a perpendicular bisector of a segment are exactly those equidistant from the segment's endpoints; and a line tangent to a circle is perpendicular to the radius meeting it.

2 Prove theorems, test conjectures and identify logical errors.

Include theorems establishing the properties in Core Skill 1 and other theorems about angles, parallel and perpendicular lines, similarity and congruence of triangles.

3 Construct and interpret representations of geometric objects.

Include classical construction techniques and construction techniques supported by modern technologies. Include moving between two-dimensional representations and the three-dimensional objects they represent, such as in schematics, assembly instructions, perspective drawings and multiple views.

4 Solve problems involving measurements.

Include measurement (length, angle measure, area, surface area, and volume) of a variety of figures and shapes in two- and three-dimensions. Compute measurements using formulas and by decomposing complex shapes into simpler ones.

5 Solve problems involving similar triangles and scale drawings.

Include computing actual lengths, areas and volumes from a scale drawing and reproducing a scale drawing at a different scale.

6 Apply properties of right triangles and right triangle trigonometry to solve problems.

Include using the Pythagorean theorem and properties of special right triangles, and applying sine, cosine and tangent to determine lengths and angle measures of right triangles. Use right triangles and their properties to solve real-world problems. Limit angle measures to degrees.

DRAFT

Coordinates

Core Concepts · Students understand that:

A Locations in the plane or in space can be specified by pairs or triples of numbers called coordinates.

B Coordinates link algebra with geometry and allow methods in one domain to solve problems in the other.

C The set of solutions to an equation in two variables forms a curve in the coordinate plane—such as a line, parabola, circle—and the solutions to systems of equations correspond to intersections of these curves.

A Coherent Understanding of Coordinates. Applying a coordinate system to Euclidean space connects algebra and geometry, resulting in powerful methods of analysis and problem solving.

Just as the number line associates numbers with locations in one dimension, a pair of perpendicular axes associates pairs of numbers with locations in two dimensions. This correspondence between numerical coordinates and geometric points allows methods from algebra to be applied to geometry and vice versa. The solution set of an equation becomes a geometric curve, making visualization a tool for doing and understanding algebra. Geometric shapes can be described by equations, making algebraic manipulation into a tool for geometric understanding, modeling and proof.

Coordinate geometry is a rich field for exploration. How does a geometric transformation such as a translation or reflection affect the coordinates of points? How is the geometric definition of a circle reflected in its equation?

Adding a third perpendicular axis associates three numbers with locations in three dimensions and extends the use of algebraic techniques to problems involving the three-dimensional world we live in.

Connections to Shape, Quantity, Equations and Functions. Coordinates can be used to reason about shapes. In applications, coordinate values often have units (such as meters and bushels). A one-variable equation of the form $f(x) = g(x)$ may be solved in the coordinate plane by finding intersections of the curves $y = f(x)$ and $y = g(x)$.

Core Skills · Students can and do:

1 Translate fluently between lines in the coordinate plane and their equations.

Include predicting visual features of lines by inspection of their equations, determining the equation of the line through two given points, and determining the equation of the line with a given slope passing through a given point.

2 Identify the correspondence between parameters in common families of equations and the location and appearance of their graphs.

Include common families of equations—the graphs of $Ax + By = C$, $y = mx + b$ and $x = a$ are straight lines; the graphs of $y = a(x - h)^2 + k$ and $y = Ax^2 + Bx + C$ are parabolas; and the graph of $(x - h)^2 + (y - k)^2 = r^2$ is a circle.

3 Use coordinates to solve geometric problems.

Include proving simple theorems algebraically, using coordinates to compute perimeters and areas for triangles and rectangles, finding midpoints of line segments, finding distances between pairs of points and determining when two lines are parallel or perpendicular.

DRAFT

Probability

Core Concepts · Students understand that:

A Probability models outcomes for situations in which there is inherent randomness, quantifying the degree of uncertainty in terms of relative frequency of occurrence.

B The law of large numbers provides the basis for estimating certain probabilities by use of empirical relative frequencies.

C The laws of probability govern the calculation of probabilities of combined events.

D Interpreting probabilities contextually is essential to rational decision-making in situations involving randomness.

A Coherent Understanding of Probability. Probability assesses the likelihood of an event in a situation that involves randomness. It quantifies the degree of certainty that an event will happen as a number from 0 through 1. This number is generally interpreted as the relative frequency of occurrence of the event over the long run.

The structure of a probability model begins by listing or describing the possible outcomes for a random situation (the sample space) and assigning probabilities based on an assumption about long-run relative frequency. In situations such as flipping a coin, rolling a number cube, or drawing a card, it is reasonable to assume various outcomes are equally likely.

Compound events constructed from these simple ones can be represented by tree diagrams and by frequency or relative frequency tables. The probabilities of compound events can be computed using these representations and by applying the additive and multiplicative laws of probability. Interpreting these probabilities relies on an understanding of independence and conditional probability, approachable through the analysis of two-way tables.

Converting a verbally-stated problem into the symbols and relations of probability requires careful attention to words such as *and*, *or*, *if*, and *all*, and to grammatical constructions that reflect logical connections. This is especially true when applying probability models to real-world problems, where simplifying assumptions are also usually necessary in order to gain at least an approximate solution.

Connections to Statistics and Expressions. Probability is the foundation for drawing valid conclusions from sampling or experimental data. Counting has an advanced connection with Expressions through Pascal's triangle and binomial expansions.

Core Skills · Students can and do:

1 Compute theoretical probabilities by systematically counting points in the sample space.

Make use of symmetry and equally likely outcomes. Include permutation and combination problems as long as small numbers are involved or technology is used, so that formulas are not required.

2 Interpret probabilities of compound events using concepts of independence and conditional probability.

Include reading conditional probabilities from two-way tables.

3 Compute probabilities of compound events.

Make use of the additive and multiplicative laws of probability, tree diagrams and frequency or relative frequency tables in real contexts. Do not emphasize fluency with the related formulas

4 Estimate probabilities empirically.

Include using data from simulations carried out with technology to estimate probabilities.

5 Identify and explain common misconceptions regarding probability.

Include misconceptions about long-run versus short-run behavior of relative frequencies (the law of large numbers). Include attention to the use and misuse of probability in the media, especially in terms of interpreting charts and tables and in the contextual meaning of terms connected to probability, such as 'odds' or 'risk.'

6 Adapt probability models to solve real-world problems.

Include the use of conditional probability to assess subsets of data (e.g., what does the data say about males and females separately). Include the use of independence as a simplifying assumption (e.g., find the probability that two students both contract the disease this year).

DRAFT

Statistics

Core Concepts · Students understand that:

A Statistical methods take variability into account to support making informed decisions based on quantitative studies designed to answer specific questions.

B Visual displays and summary statistics condense the information in data sets into usable knowledge.

C Randomness is the foundation for using statistics to draw conclusions when testing a claim or estimating plausible values for a population characteristic.

D The design of an experiment or sample survey is of critical importance to analyzing the data and drawing conclusions.

A Coherent Understanding of Statistics. Decisions or predictions are often based on data—numbers in context. These decisions or predictions would be easy if the data always sent a clear message, but the message is often obscured by variability in the data. Statistics provides tools for describing variability in data and for making informed decisions that take variability into account.

Data are gathered, displayed, summarized, examined and interpreted to discover patterns. Data can be summarized by a statistic measuring center, such as mean or median, and a statistic measuring spread, such as interquartile range or standard deviation. Different distributions can be compared numerically using these statistics or visually using plots. Which statistics to compare, and what the results of a comparison might mean, depend on the question to be investigated and the real-life actions to be taken.

Randomization has two important uses in drawing statistical conclusions. First, collecting data from a random sample of a population makes it possible to draw valid conclusions about the whole population, taking variability into account. Second, randomly assigning individuals to different treatments allows a fair comparison of the effectiveness of those treatments. A statistically significant outcome is one that is unlikely to be due to chance and this can be evaluated only under the condition of randomness.

In critically reviewing uses of statistics in public media and other reports, it is important to consider the study design, how the data were collected, and the analyses employed as well as the data summaries and the conclusions drawn.

Connections to Probability, Functions and Modeling. Valid conclusions about a population depend on designed simulations or other statistical studies using random sampling or assignment and rely on probability for their interpretation. Functional models may be used to approximate data. If the data are approximately linear, the relationship may be modeled with a trend line and the strength and direction of such a relationship may be expressed through a correlation coefficient. Technology facilitates the study of statistics by making it possible to simulate many possible outcomes in a short amount of time, and by generating plots, function models, trend lines and correlation coefficients.

Core Skills · Students can and do:

1 Formulate questions that can be addressed with data. Identify the relevant data, collect and organize it to respond to the question.

Include determining whether a question can best be addressed through a sample survey, randomized experiment or observational study. Include unbiased selection for a sample and randomization of assignment to treatment for an experiment.

2 Use appropriate displays and summary statistics for data.

Include univariate, bivariate, categorical and quantitative data. Include the thoughtful selection of displays and measures of center and spread to summarize data.

3 Interpret data displays and summaries critically; draw conclusions and develop recommendations.

Include paying attention to the context of the data, interpolating or extrapolating judiciously, and examining the effects of extreme values of the data on summary statistics of center and spread. Include data sets that follow a normal distribution. Include observing and interpreting linear trends in bivariate quantitative data.

4 Draw statistical conclusions involving population means or proportions using sample data.

Conclusions should be based on simulations or other informal techniques, rather than formulas.

5 Evaluate reports based on data.

Include looking for bias or flaws in the way the data were gathered or presented, as well as unwarranted conclusions, such as claims that confuse correlation with causation.

DRAFT

Sample of Works Consulted

I. National Reports and Recommendations

A. *Adding it Up: Helping Children Learn Mathematics*. National Council of Teachers of Mathematics, Mathematics Learning Study Committee, 2001.

B. *Crossroads in Mathematics*, 1995 and *Beyond Crossroads, 2006*. American Mathematical Association of Two-Year Colleges (AMATYC).

C. *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics: A Quest for Coherence*. National Council of Teachers of Mathematics, 2006.

D. *Foundations for Success: Final Report of the National Mathematics Advisory Panel* (NMAP), 2008.

E. *Guidelines for Assessment and Instruction in Statistics Education (GAISE) project* http://www.amstat.org/education/gaise/.

F. *Habits of Mind: An Organizing Principle for a Mathematics Curriculum*. Cuoco, A. , Goldenberg, E. P., and Mark, J. (1996). Journal of Mathematical Behavior, 15 (4), 375-402. Last retrieved July 15, 2009, from http://www2.edc.org/CME/showcase/HabitsOfMind.pdf.

G. *How People Learn: Brain, Mind, Experience, and School*. Bransford, J.D., A.L. Brown and R.R. Cocking, eds.. Committee on Developments in the Science of Learning, Commission on Behavioral and Social Sciences and Education, National Research Council, 1999.

H. *Mathematics and Democracy, The Case for Quantitative Literacy*, edited by Lynn Arthur Steen. National Council on Education and the Disciplines, 2001.

I. *The Opportunity Equation: Transforming Mathematics and Science Education for Citizenship and the Global Economy*. The Carnegie Corporation of New York and the Institute for Advanced Study, 2009. Online: http://www.opportunityequation.org/

J. *Principles and Standards for School Mathematics*. National Council of Teachers of Mathematics, 2000.

K. *Quantitative Literacy and Mathematical Competencies*. Niss, Mogen. Last retrieved July 15, 2009, from http://www.maa.org/Ql/pgs215_220.pdf

L. *A Research Companion to Principles and Standards for School Mathematics*. National Council of Teachers of Mathematics, 2003.

M. *Focus in High School Mathematics: Reasoning and Sense Making*. National Council of Teachers of Mathematics. Reston, VA: NCTM, in press.

N. *What is Mathematics? A Pedagogical Answer to a Philosophical Question*. Harel, G.. In R. B. Gold & R. Simons (Eds.), *Current Issues in the Philosophy of Mathematics from the Perspective of Mathematicians*, Mathematical Association of America, 2008.

O. Blum, W., Galbraith, P. L., Henn, H-W. and Niss, M. (Eds) *Applications and Modeling in Mathematics Education*, ICMI Study 14. Amsterdam: Springer.

II. College Readiness

A. ACT College Readiness Benchmarks™ last retrieved July 14, 2009, from http://www.act.org/research/policymakers/pdf/benchmarks.pdf

B. ACT College Readiness Standards™

C. ACT National Curriculum Survey™

D. Adelman, Cliff. *The Toolbox Revisited: Paths to Degree Completion From High School Through College*, 2006. http://www.ed.gov/rschstat/research/pubs/toolboxrevisit/index.html

E. *Advanced Placement Calculus, Statistics and Computer Science Course Descriptions. May 2009, May 2010.* College Board, 2008.

F. *Aligning Postsecondary Expectations and High School Practice: The Gap Defined* (Policy Implications of the ACT National Curriculum Survey Results 2005-2006). Last retrieved July 14, 2009, from www.act.org/research/policymakers/pdf/NCSPolicyBrief.pdf

G. *Condition of Education, 2004: Indicator 30, Top 30 Postsecondary Courses, U.S. Department of Education,* 2004.

H. *Condition of Education, 2007: High School Course-Taking*. U.S. Department of Education, 2007.

I. Conley, D.T. *Knowledge and Skills for University Success*, 2008.

J. Conley, D.T. *Toward a More Comprehensive Conception of College Readiness*, 2007.

K. *Crisis at the Core: Preparing All Students for College and Work.* ACT, Last retrieved July 14, 2009, from www.act.org/research/policymakers/pdf/crisis_report.pdf

L. Achieve, Inc., Florida Postsecondary Survey, 2008.

M. Golfin, Peggy, et. al. CNA Corporation. *Strengthening Mathematics at the Postsecondary Level: Literature Review and Analysis*, 2005.

N. Camara, W.J., Shaw, E., and Patterson, B. (June 13, 2009). First Year English and Math College Coursework. College Board: New York, NY (Available from authors).

O. CLEP Precalculus Curriculum Survey: Summary of Results. The College Board, 2005.

P. College Board Standards for College Success: Mathematics and Statistics. College Board, 2006. http://www.collegeboard.com/prod_downloads/about/association/academic/mathematics-statistics_cbscs.pdf.

Q. Miller, G.E., Twing, J., and Meyers, J. "Higher Education Readiness Component (HERC) Correlation Study." Austin, TX: Pearson.

R. *On Course for Success: A Close Look at Selected High School Courses That Prepare All Students for College and Work.* ACT. Last retrieved July 14, 2009, from www.act.org/research/policymakers/pdf/success_report.pdf

S. *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up*. Achieve, 2008.

T. *Ready for College and Ready for Work: Same or Different?* ACT. Last retrieved July 14, 2009, from www.act.org/research/policymakers/pdf/ReadinessBrief.pdf

U. *Ready or Not: Creating a High School Diploma That Counts.* American Diploma Project, 2004. http://www.achieve.org/ReadyorNot

V. Rigor at Risk: Reaffirming Quality in the High School Core Curriculum. ACT, Last retrieved July 14, 2009, from www.act.org/research/policymakers/pdf/rigor_report.pdf

W. *The Forgotten Middle: Ensuring that All Students Are on Target for College and Career Readiness before High School.* ACT, Last retrieved July 14, 2009, from http://www.act.org/research/policymakers/reports/ForgottenMiddle.html

X. Achieve, Inc., Virginia Postsecondary Survey, 2004.

III. Career Readiness

A. ACT Job Skill Comparison Charts

B. Achieve's Mathematics at Work, 2008. http://www.achieve.org/mathatwork

C. *The American Diploma Project Workplace Study*. National Alliance of Business Study, 2002.

D. Carnevale, Anthony and Desrochers, Donna. *Connecting Education Standards and Employment: Course-taking Patterns of Young Workers,* 2002.

http://www.edroundtable.state.in.us/pdf/adp/ADPWorkplaceStudy.pdf

E. Colorado Business Leaders Top Skills, 2006.

F. *Hawai'i Career Ready Study: access to living wage careers from high school*, 2007.

G. *Ready or Not: Creating a High School Diploma That Counts.* American Diploma Project, 2004. http://www.achieve.org/ReadyorNot

H. States' Career Cluster Initiative. *Essential Knowledge and Skill Statements*, 2008.

I. WorkKeys Occupational Profiles™

http://www.act.org/workkeys/profiles/occuprof/index.html

IV. International Documents

STANDARDS [High performing countries/countries of interest]

A. Alberta

Alberta Learning, *Pure Mathematics 10–20–30 (Senior High)*, 2002. (Grades 10-12)

B. Belgium

Department for Educational Development: Core Curriculum. (Grades 9-10 and 11-12) Retrieved June 24, 2009 from http://www.ond.vlaanderen.be/dvo/english/corecurriculum/corecurriculum.htm

C. China

Compulsory mathematics curriculum for senior secondary, as submitted to the APEC consortium. (Grades 10-12) Last retrieved July 13, 2009, from http://www.apecknowledgebank.org/file.aspx?id=1895

D. Chinese Taipei

- Curriculum Guidelines for the Required Subject Math in Senior High Schools, as submitted to the APEC consortium. (Grades 10-11) Last retrieved July 13, 2009 from http://www.apecknowledgebank.org/file.aspx?id=1900
- Curriculum Guidelines for the Elective Subject Math (I) in Senior High Schools, as submitted to the APEC consortium. (Grades 12) Last retrieved July 13, 2009, from http://www.apecknowledgebank.org/file.aspx?id=1901

E. England

Qualifications and Curriculum Authority. *Programme of Study for Key Stage 4, National Curriculum,* 2007. (Grades 10-11)

F. Finland

Finnish National Board of Education. *National Core Curriculum For Upper Secondary Schools 2003*. (Grades 10-12)

G. Hong Kong

Learning Objectives for Key Stage 4. (Grades 10-11)

H. India

- *The National Curriculum Framework,* 2005. (Grades 9-12). National Council of Educational Research and Training. Last retrieved July 13, 2009, from http://ncert.nic.in/html/pdf/schoolcurriculum/framework05/prelims.pdf
- *Secondary School Curriculum, (2010).* (Grades 9-10). Central Board of Education.
- *Senior School Curriculum, (2010).* (Grades 11-12). Central Board of Secondary Education.

I. Ireland

- *Junior Certificate Mathematics Syllabus (Higher, Ordinary and Foundation Level).* (Grades 7-9). National Council for Curriculum and Assessment, 2000.
- The Leaving Certificate *Mathematics Syllabus. (Higher, Ordinary and Foundation Level).* (Grades 10-12). National Council for Curriculum and Assessment, 2000.

J. Japan

The Courses of Study in Japan, Provisional and Unofficial Translation, 2004, as submitted to the APEC consortium. (Grades 10-12). Last retrieved July 13, 2009, from http://www.apecknowledgebank.org/file.aspx?id=1896.

K. Korea

The Seventh National School Curriculum, as submitted to the APEC consortium. (Grades 7-10). Last retrieved July 13, 2009, from http://www.apecknowledgebank.org/file.aspx?id=1897 and http://www.apecknowledgebank.org/file.aspx?id=1898

L. Singapore

Secondary Mathematics Syllabuses, 2007, as submitted to the APEC consortium. (Grades ≈7-10/11). Last retrieved July 13, 2009, from http://www.moe.gov.sg/education/syllabuses/sciences/files/maths-secondary.pdf.

ASSESSMENTS [Key international assessments with global reach]

A. Program for International Student Assessment (PISA), 2006.

B. Trends in International Mathematics and Science Study (TIMSS), 2007.

C. International Baccalaureate, Mathematics Standard Level, 2006.

D. University of Cambridge International Examinations: General Certificate of Secondary Education in Mathematics, 2009.

E. EdExcel, General Certificate of Secondary Education, Mathematics, 2009.

F. Lundsgaard Hansen, Birthe and Vagn. Reference levels in School Mathematics, Education in Europe, National Presentation, Denmark, 2001. Last retrieved July 15, 2009, from http://www.emis.de/projects/Ref/doc_ems_pdf/EMS_NATIONAL_PRESENTATIONS/EMS_DENMARK.pdf

V. State Documents

A. California State Standards

B. Florida State Standards

C. Georgia State Standards

D. Massachusetts State Standards

E. Mathematics Curriculum Framework Revision Panel [Revised Progress Report]. Massachusetts Department of Elementary and Secondary Education, 2009. Last retrieved July 15, 2009, from http://www.doe.mass.edu/boe/docs/0509/item5_report.pdf.

F. Minnesota State Standards

English Language Arts

K–12

Introduction

The *Standards for English Language Arts K–12* are the culmination of an extended, broad-based effort to fulfill the charge issued by the states to create the next generation of English language arts (ELA) standards. Its companion document, *Standards for Literacy in History and Science 6–12*, extends the same principle to communication skills in other content areas. The present work, led by the Council of Chief State School Officers (CCSSO) and the National Governors Association (NGA), builds on the foundation laid by states in their decades-long work on crafting high-quality education standards. The *Standards* also draw upon the most important international models as well as research and input from numerous sources, including scholars, assessment developers, professional organizations, and educators from kindergarten through college. In their design and content, the *Standards* represent a synthesis of the best elements of standards-related work to date and an important advance over that previous work.

As specified by CCSSO and NGA, the *Standards* are (1) research and evidence based, (2) aligned with college and work expectations, (3) rigorous, and (4) internationally benchmarked. A particular standard was to be included in the document only when the best available evidence indicated that its mastery was essential for students to be college and career ready in a twenty-first-century, globally competitive society. As new and better evidence emerges, the *Standards* will be revised accordingly.

The *Standards* are an extension of a prior initiative led by CCSSO and NGA to develop college and career readiness (CCR) standards in reading, writing, and speaking and listening as well as in mathematics. The CCR Reading, Writing, and Speaking and Listening Standards, released in draft form in September 2009, served as a touchstone for the present work. While the format, structure, content, and purpose of that earlier document differ in some ways from this document, the basic aims and concepts are clearly connected. The main difference is that while the earlier CCR document defined a goal toward which education efforts should aim—college and career readiness for all students—the current document describes the progressive development of skills and understandings across the grades necessary for all students to reach that goal. Just as feedback on the September 2009 CCR draft has greatly influenced the design and development of the K–12 standards, so too will the response to the K–12 standards help guide subsequent revisions to the CCR standards. In their final forms, both documents—CCR and K–12—will be tightly aligned and mutually supporting.

While the *Standards* treat college and career readiness for all students as the end point—an ambitious goal in its own right—many students will reach this point before the end of high school. For them, advanced work in literature, composition, language, history, science, and so on should be available. It is beyond the scope of the *Standards* to describe what such advanced work should consist of, but it needs to provide the next logical step up from the college and career readiness baseline established here.

As a natural outgrowth of meeting the charge to define college and career readiness, the *Standards* also lay out a vision of what it means to be a literate person in the twenty-first century. Indeed, the skills and understandings students must demonstrate have broad applicability outside of the classroom or workplace. The *Standards* insist upon the sort of close, attentive reading that is at the heart of understanding and appreciating the aesthetics of literature. They require the sort of critical reading that is necessary to sift carefully through the staggering amount of information available today in print and online. They demand the sort of wide, deep, and thoughtful engagement with high-quality literary and informational text that builds knowledge, enlarges experience, and broadens world views. They mandate the sort of cogent reasoning and use of evidence that is essential to both private deliberation and responsible citizenship in a democratic republic. In short, they promote the development of skills in reading, writing, speaking, and listening that are the foundation for any creative and purposeful expression in language.

Key design considerations

A blend of cross-cutting and specific standards

The Reading, Writing, and Speaking and Listening strands include two levels of standards. The cross-cutting Core Standards are the same across the two *Standards* documents, their commonality emphasizing the broad responsibility within the school for meeting the standards and also facilitating schoolwide professional development. Then there are specific Standards that are unique to a given content area, which respects the particular demands of reading, writing, speaking, and listening in ELA and in other disciplines.

A focus on results rather than means

The *Standards* define what all students must learn, not everything that teachers are allowed to teach. By focusing on required achievements, the *Standards* leave room for teachers, curriculum developers, and states to determine how those goals should be reached and what additional topics should be addressed. The *Standards* require, for example, that all students be able to produce writing in a variety of situations, including those that allow time for revision. The *Standards* do not, however, specify a particular writing process that students must use (although certain elements common to process-writing approaches, particularly revision, are embedded in the requirements). Teachers are thus freed—and obligated—to provide students with whatever tools and knowledge their professional judgment and experience identify as most helpful for those assignments that allow for multiple drafts. Similarly, the *Standards*, with their emphasis on observable outcomes, do not enumerate various metacognitive strategies that students may need to use to monitor and direct their thinking and learning.

Shared responsibility for literacy

The *Standards for English Language Arts K–12* and the *Standards for Literacy in History and Science 6–12* together establish the requirement that instruction in reading, writing, speaking, listening, and language use be a shared responsibility. The *Standards* present reading instruction in K–5 as fully integrative, including a rich blend of narratives, drama, poetry, and informational text. ELA-specific instruction in grades 6 and above includes fiction, poetry, and drama but also a particular form of informational text: literary exposition and argument (e.g., speeches, essays, and historical documents with significant cultural importance and literary merit). Teachers in other content areas must use their unique disciplinary expertise to help students meet the particular challenges of reading, writing, speaking, listening, and language use in their respective field. Progress toward college and career readiness and building a rich knowledge base require that at least half of the reading students do must focus on history, science and related disciplines. This distributed approach honors the unique place of English language arts instruction in literacy development while ensuring that students have communication skills tailored to the demands of other disciplines. It also reflects the reality that students must communicate effectively in a wide range of disciplines, not just ELA.

Grade bands to describe growth, grades to focus instruction

Evidence consulted in creating the *Standards* suggests that beyond the earliest grades, major developments in students' literacy skills typically occur across spans of grades rather than within individual grades. This document stays true to that evidence by organizing standards after grade 3 into multiyear bands (grades 4–5, 6–8, 9–10, and 11–CCR). At the same time, the work of educating students does proceed on a day-to-day, year-to-year basis. Any standards document must therefore provide guidance to educators on what each year's instruction and assessment should look like. To make the grade specific focuses for instruction clear, after the descriptions of the standards in each area of ELA, we provide a one page summary of the grade specific focuses for each grade from fourth grade onwards, including how the grade specific focus in each area relates to the grade band requirements. The Standards offer that focus through several grade-specific elements:

- Single-grade standards in many areas of kindergarten and grades 1, 2, and 3
- Text complexity expectations in Reading, beginning at grade 2
- Areas of focus in Writing, beginning at grade 4

- Areas of focus in the Conventions section of Language Development, beginning at grade 4

Research and media skills integrated into the standards as a whole

To be ready to meet the challenges of the twenty-first century, students need a mix of the communication skills that have served literate people for millennia and new competencies necessary in an information- and media-saturated world. To be ready for college, workforce training, and life in a technological society, students need the ability to gather, comprehend, evaluate, synthesize, report on, and create a high volume and extensive range of print and nonprint texts in media forms old and new. Just as the need to research and to consume and produce media are embedded into every element of today's curriculum, so too are the associated skills and understandings embedded throughout the *Standards* rather than treated separately. Web links to sample media texts are included selectively among the reading text exemplars in Appendix B to reinforce the point that print and online materials can be used together instructionally to enhance students' understanding.

An integrated model of English language arts

Although the *Standards* divide the English language arts into Reading, Writing, Speaking and Listening, and Language Development strands for conceptual purposes, the processes of communication are in theory and practice an undivided whole. As illustrated in the graphic that introduces each grade or grade band and as embodied in the content of the standards themselves, reading, writing, speaking, listening, and language development are tightly interrelated and often reciprocal.

Central features of the document

Reading and Literature: Text complexity and the growth of comprehension

As students advance through the grades, they must be able to handle independently texts of steadily increasing complexity and be able to gain more from what they read. Beginning formally at grade 2, the *Standards* specify what proportion of texts students read should be within grade band and, at some grades, above grade band. (Additional material in Appendix A of the *Standards* defines and explains text complexity in more detail.) Whatever texts they are reading, students must also show a steadily increasing ability to discern more from and make fuller use of text. This means, for example, finding and making an increasing number of connections among ideas and between texts; considering a wider range of textual evidence; and becoming more sensitive to inconsistencies, ambiguities, and poor reasoning in texts. The *Standards* place growing demands on students' comprehension at each higher grade or grade band to ensure that all students are college- and career-ready readers no later than the end of high school.

Writing and Research: Text types, grade-level focuses, and research

While some writing skills, such as the ability to reflect audience, purpose, and task in what one writes, are important for many types of writing, others are more properly part of writing in specific text types: narrative, informative and explanatory text, and argument. Beginning at grade 4, the *Standards* specify the sorts of writing over extended and shorter timeframes that students in each grade must be able to produce in response to sources. Although conducting research calls upon reading, speaking, listening, and language skills, writing is typically central to analyzing information and presenting findings. The *Standards* pair writing and research to signal that close connection.

Speaking and Listening: Flexible communication

Including but not limited to skills necessary for formal presentations, the Speaking and Listening strand requires students to develop a range of broadly useful oral communication and interpersonal skills: listening attentively, participating productively, exchanging information, and speaking effectively. Students must learn to sift through and evaluate multiple points of view; listen thoughtfully in order to build on and constructively question the ideas of others while contributing their own ideas; and, where appropriate, reach agreement and common goals through teamwork.

CONFIDENTIAL

Language Development: Conventions and vocabulary

The Conventions standards in the Language Development strand include the essential "rules" of formal written and spoken English, but they also approach language as a matter of craft and informed choice among alternatives. Thus, standards pertaining to grammar and usage, mechanics, and the fundamentals of language and writing are accompanied by standards on word choice and style. The Vocabulary standards focus both on understanding words and their nuances and on acquiring new words through conversation and reading and by being taught them directly. Rather than require that students use one particular skill or another to determine a word's meaning, the Vocabulary standards insist only that students get the proper meaning, with the means (context, word analysis, and so on) to be chosen flexibly based on the situation.

Appendices

The *Standards* include a range of supporting materials that help explain and enrich the main document:

- Appendix A contains a model of text complexity, including both qualitative and quantitative measures of how easy or hard a text is to read, as well as supplementary statements about instruction in writing, language conventions, and vocabulary
- Appendix B consists of text exemplars at all grades/bands to illustrate appropriate complexity and quality in the text types required by the Reading standards
- Appendix C consists of annotated writing samples to show how grade- or grade-band-appropriate writing embodies the relevant Writing standards

January 2010

CONFIDENTIAL DRAFT

Student Practices in Reading, Writing, Speaking, Listening, and Language Use

The following Student Practices in reading, writing, speaking, listening, and language use undergird and help unify the rest of the *Standards*. The Student Practices are not themselves standards: every idea introduced here is subsequently represented in one or more places within the larger document. They are, rather, the "premises"—broad statements about the nature of college and career readiness in reading, writing, speaking, listening, and language use—that underlie the individual standards and cut across the various sections of the document.

* * *

As students progress toward being college and career ready, they exhibit with increasing fullness and regularity the following capacities in their reading, writing, speaking, listening, and language use:

1. They demonstrate independence as readers, writers, speakers, listeners, and language users.

Students can, without significant scaffolding or support, comprehend and evaluate complex text across a range of types and disciplines, and they can construct effective arguments and clearly convey intricate or multifaceted information. Likewise, students are independently able to discern a speaker's key points as well as ask questions, build on others' ideas, and articulate their own ideas. They apply language conventions without prompting. On their own, they determine the meaning of words in context and acquire and use new words.

2. They build strong content knowledge.

Students build a base of knowledge across a wide range of subject matter by engaging with works of quality and substance. They demonstrate their ability to become proficient in new areas through research and study. They read purposefully and listen attentively to gain both general knowledge and the discipline-specific expertise needed to comprehend subject matter and solve problems in different fields. They refine their knowledge and share it through substantive writing and speaking.

3. They respond to the varying demands of audience, task, purpose, and discipline.

Students consider their reading, writing, speaking, listening, and language use in relation to the contextual factors of audience, task, purpose, and discipline. They appreciate nuances, such as how the composition and familiarity of the audience should affect tone and how the connotations of words affect meaning. They also know that different disciplines call for different types of evidence (e.g., documentary evidence in history, experimental evidence in the sciences).

4. They comprehend as well as critique.

Students are engaged and open-minded—but skeptical—readers and listeners. They work diligently to understand precisely what an author or speaker is saying, but they also question an author's or speaker's assumptions and assess the veracity of claims.

5. They privilege evidence.

Students cite specific evidence when offering an oral or written interpretation of a text. They use relevant evidence when supporting their own points in writing and speaking, making their reasoning clear to the reader or listener, and they constructively evaluate others' use of evidence.

6. They care about precision.

Students are mindful of the impact of specific words and details, and they consider what would be achieved by different choices. Students pay especially close attention when precision matters most, such as in the case of reviewing significant data, making important distinctions, or analyzing a key moment in the action of a play or novel.

7. They craft and look for structure.

Students attend to structure when organizing their own writing and speaking as well as when seeking to understand the work of others. They understand and make use of the ways of presenting information typical of different disciplines. They observe, for example, how authors of literary works craft the structure to unfold events and depict the setting.

8. They use technology strategically and capably.

Students employ technology thoughtfully to enhance their reading, writing, speaking, listening, and language use. They tailor their searches online to acquire useful information efficiently, and they integrate what they learn using technology with what they learn offline. They are familiar with the strengths and limitations of various technological tools and mediums and can select and use those best suited to their communication goals.

9. They come to understand other perspectives and cultures.

Students appreciate that the twenty-first-century classroom and workplace are diverse settings in which people from often widely divergent backgrounds must learn and work together. They actively seek to understand other perspectives and cultures through reading and listening. They do not simply adopt other points of view as their own but rather evaluate them critically and constructively. Literature can play a special role in expanding students' horizons in this way: through reading great classic and contemporary works, students can vicariously inhabit worlds and experiences much different than their own.

CONFIDENTIAL

English Language Learners

The *Standards* articulate rigorous grade-level expectations in the areas of speaking, listening, reading and writing to prepare students to be college and career ready. English language learners (ELLs) must be held to the same high standards expected of students who are already proficient in English. However, because these students are acquiring English language proficiency and content area knowledge concurrently, some students will require additional time and all will require appropriate instructional support and aligned assessments.

ELLs are a heterogeneous group with differences in ethnic background, first language, socio-economic status, quality of prior schooling, and levels of English language proficiency. Effectively educating these students requires adjusting instruction and assessment in ways that consider these factors. For example ELLs who are literate in a first language that shares cognates with English can apply first-language vocabulary knowledge when reading in English; likewise ELLs with high levels of schooling can bring to bear conceptual knowledge developed in their first language when reading in a second language. On the other hand, ELLs with limited or interrupted schooling will need to acquire background knowledge prerequisite to educational tasks at hand. As they become acculturated to US schools, ELLs who are newcomers will need sufficiently scaffolded instruction and assessments to make sense of content delivered in a second language and display this content knowledge.

While some ELLs are economically and educationally advantaged, this is not the case for many of these students. Moreover, once in the U.S., the majority of ELLs attend high poverty schools with high percentages of other ELLs. These schools often lack the resources and capacity needed to help ELLs reach high academic standards. However, schools and districts can be assisted in providing a positive learning environment that capitalizes on the linguistic and cultural diversity of the student body.

To help ELLs meet high academic standards in reading, writing, speaking, listening and language use it is essential that ELLs have access to:

- The requisite coursework to prepare them for post-secondary education or the workplace;
- Coursework that is made comprehensible for students learning content in a second language, through specific pedagogical techniques and additional resources;
- Teachers, as well as school-level and district personnel, who are well prepared and qualified to support English-language learners;
- Well designed opportunities for classroom discourse and interaction to enable ELLs to develop communicative strengths in language arts
- Speakers of English who know the language well enough to provide the ELLs with models and support; and
- Ongoing assessment and feedback to guide learning.

It is also worth noting that instruction for these students is additionally guided by language proficiency standards that language arts teachers can use in conjunction with the English language arts standards to help ELLs become fully proficient and literate in English.

Access for Students with Disabilities

The *Standards* articulate rigorous expectations in the areas of reading, writing, speaking, listening, and language use in order to prepare students to be college and career ready. These standards identify the knowledge and skills students must acquire in order to be successful. Research shows that students with disabilities are capable of high levels of learning and should not be limited by low expectations and watered down curriculum. The vast majority of this population of students, including students with intellectual impairments,[1] *can* achieve proficiency when they receive high-level instruction and accommodations. It is imperative that these highly capable students—regardless of their disability—are held to the same expectations articulated in the Core Standards as other students.

However, *how* these high standards are taught is of the utmost importance in reaching students with special needs. When acquiring the knowledge and skills represented in the Core Standards, students with disabilities may need accommodations[2] or—in exceptional cases—modified goals, incorporated in an individualized education program (IEP),[3] to help them access information or demonstrate their knowledge. In instances when a standard asks students to perform actions they are physically incapable of, students will need to be presented with alternative options to demonstrate similar knowledge and skills within the range of their abilities. Accommodations based on individual needs allow students of all disability levels to learn within the framework of the *Standards*.

Meeting English Language Arts (ELA) Standards

Reading, writing, speaking, listening, and language use standards—given the nature of the standards themselves—often require accommodations for students with disabilities. For example, a standard that calls for "listening" should be interpreted to include reading sign language. "Speaking" should be read broadly to include "communication" or "self-expression." "Reading" should allow for students' use of Braille, screen reader technology, or other assistive devices to demonstrate comprehension skills. In a similar vein, "writing" should not preclude the use of a scribe, computer, or speech-to-text technology. With appropriate accommodations and support, students with all levels of disabilities can participate in the general education curriculum and achieve grade-level proficiency with regard to the ELA content and skills articulated in the *Standards*.

In short, while the *Standards* set and retain high expectations for all students, they may need to be translated and occasionally modified to apply appropriately to students with disabilities, including all levels of intellectual impairment. Promoting a culture of high expectations for all students is a fundamental goal of the *Standards*. Achieving this goal requires the inclusion of students with disabilities.

[1] Less than two percent of the population of all students and less than 20% of the population of students with disabilities.

[2] See the Council of Chief State School Officers, (2005). *Training District and State Personnel on Accommodations: A Study of State Practices, Challenges, and Resources* at http://www.ccsso.org/publications/details.cfm?PublicationID=221 for further explanation and evidence around accommodations.

[3] According to the Individuals with Disabilities Act (IDEA), an IEP includes appropriate accommodations that are necessary to measure the individual achievement and functional performance of a child.

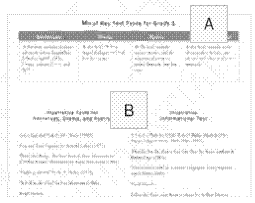
How to Read This Document

The *Standards* are divided into an ELA-specific document (*Standards for English Language Arts K–12*) and a literacy document for history and science (*Standards for Literacy in History and Science 6–12*). The ELA document includes standards for and examples of history and science reading in K–5.

The ELA-specific document is organized by grade (kindergarten and grades 1, 2, and 3) and grade band (grades 4–5, 6–8, 9–10, and 11–CCR). The *Standards for Literacy in History and Science* are organized by grade band (grades 4–5, 6–8, 9–10, and 11–CCR). Each grade/band is divided into strands—Reading, Writing, Speaking and Listening, and Language Development.

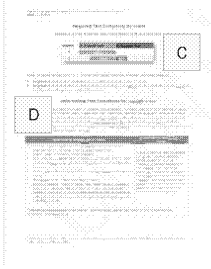
While all strands contain standards statements, each strand also has its own specific features.

Reading and Literature (ELA)/Reading (History/Science)

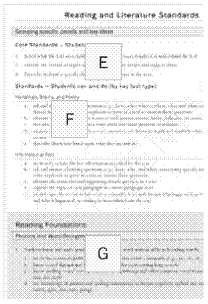


Kindergarten and grade 1 begin with the **mix of key text types (A)**, which identifies the genres and subgenres of reading material appropriate for each grade. This is followed by a list of **illustrative texts (B)** in the key text types. This list is suggestive of the sorts of texts appropriate for the grade in terms of complexity and quality; excerpts appear in Appendix B.

Grades 2, 3, 4–5, 6–8, 9–10, and 11–CCR include this information immediately after a graphic specifying **required text complexity by grade (C)**—in brief, the proportion of texts within and above grade band that students must read each year. (For example, 70% of the texts that grade 3 students read should come from the grades 2–3 text complexity band, while the other 30% should come from the grades 4–5 band.) An overview of the method for **determining text complexity (D)** in the particular grade band follows. (A fuller treatment is provided in Appendix A.)

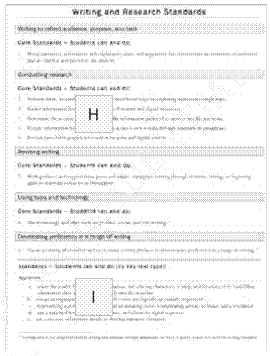


All grades/bands organize standards under a number of boxed subheadings (e.g., "Grasping specific details and key ideas"). The standards at all grade levels are divided into cross-cutting **Core Standards (E)**, which are numbered and applicable to many types of reading, and more specific **Standards (F)**, which are lettered and organized by text type (e.g., "Narratives, Drama, and Poetry"). Kindergarten and grades 1, 2, and 3 also include boxed sections of **reading foundations (G)**, which enumerate basic concepts of print and other foundational skills in reading that very young students must acquire.



Writing and Research

Cross-cutting **Core Standards (H)**, which are numbered and apply to many types of writing, are organized under a number of boxed subheadings (e.g., "Writing to reflect audience, purpose, and task"). **Standards (I)** specific to writing in particular text types—narrative, informative and explanatory text, and argument—are lettered and follow in a separate section. In kindergarten through grade 5, writing arguments takes the form of opinion writing, hence the parenthetical notation next to "Arguments" in those grades/bands.

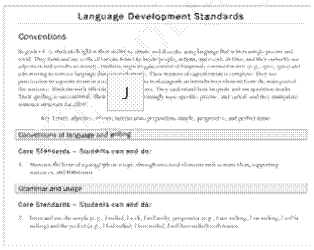


Speaking and Listening

Cross-cutting **Core Standards**, which are numbered and apply to speaking and listening in many situations, are grouped with lettered **Standards**, which set requirements for speaking and listening in key communication (e.g., "Presentation of Ideas and Information").

Language Development

This strand is organized differently in the ELA and history/science documents. The ELA strand comprises two full sections: Conventions and Vocabulary. Each section includes numbered **Core Standards** organized under a number of boxed subheadings (e.g., "Mechanics") and introduced by a brief summative paragraph and list of **key terms (J)** intended to be taught explicitly in grade-appropriate ways. ELA Vocabulary consists of three subsections—determining the meaning of words, understanding the nuances of words, and acquiring vocabulary—under each of which numbered Core Standards appear. Language Development in the history/science document consists of the summative paragraphs for Conventions and all of the Vocabulary section found in ELA except for nuances in word meaning.

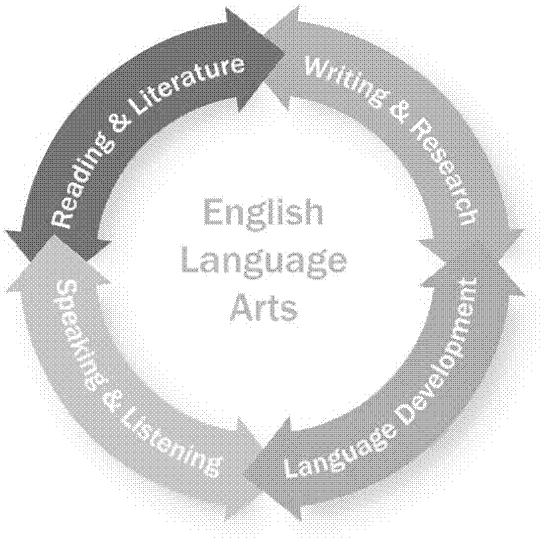


Focus for Instruction

Beginning with grade 4, a page summarizing grade-level responsibility, including grade-specific areas of focus, is provided to help distinguish responsibilities within multiyear bands.

English Language Arts

Kindergarten



Mix of Key Text Types for Kindergarten

Narratives	Drama	Poetry	Informational Text
At this level, includes children's adventure stories, biographies, folktales, legends, fables, fantasy, realistic fiction, and myth.	*At this level, includes staged dialogue and brief familiar scenes.*	*At this level, includes nursery rhymes and the subgenres of narrative poems, limericks, and free verse.*	*At this level, includes books about science, history, and the arts and other nonfiction materials.*

Illustrative Texts for Narratives, Drama, and Poetry[4]

Are You My Mother? by P.D. Eastman (1960)

Put Me in the Zoo by Robert Lopshire (1960)

"Mix a Pancake" by Christina Rosetti (1986)

Wouldn't You?" by John Ciardi (1986)

Illustrative Informational Texts

My Five Senses by Aliki (1962)

Read Alouds:

Amazing Whales! by Sarah L. Thomson (2005)

The Year at Maple Hill Farm by Alice and Martin Provensen (1978)

[4] See Appendix B for other texts illustrative of Kindergarten-Grade 1 text complexity. This list includes read-alouds.

Reading and Literature Standards[5]

Grasping specific details and key ideas

Core Standards — Students can and do:

1. Retell key details and information drawn from the text.
2. Explain the subject of the text or the problem the characters face.
3. Answer questions about characters and events that take place in the text.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. retell the beginnings, middles, and endings of stories
b. ask and answer questions about details of a text
c. identify the problems that characters face in a story and the lessons learned
d. identify the feelings of characters and the reasons for their actions
e. differentiate between realistic and fantastical elements within a story

Informational Text

a. restate key information (e.g., events, subject, ideas) from a text
b. ask and answer questions about details of a text

Reading Foundations

Print Concepts

1. Students demonstrate understanding of the organization and basic features of print.
   a. identify basic features and conventions of books and other written texts (e.g., front cover, back cover, title, author)
   b. understand that print is left to right, top to bottom, and page by page
   c. understand that words are separated by spaces in print
   d. recognize and name all upper- and lowercase letters of the alphabet

Linguistic Awareness

2. Students gain awareness of spoken words, syllables, and phonemes.
   a. recognize, recite, and produce rhyming words
   b. count, pronounce, blend, and segment syllables in spoken words
   c. recognize, blend, and segment onset and rimes of spoken words (*/g/ - /oat/; /bl/ - /ock/*)
   d. count or place tokens for individual words in spoken phrases or simple sentences
   e. orally blend and segment individual phonemes in simple, one-syllable words
   f. demonstrate phonemic awareness by isolating and pronouncing the initial and final phonemes (sounds) in three-phoneme /CVC/ words without consonant blends (e.g., */rod/, /save/, /ham/*)
   g. add or substitute individual phonemes in simple, one-syllable words to make new words (e.g., */at/ → /sat/ → /mat/ → /map/*)

[5] The expectation is that students can fulfill these standards with texts they read independently as well as texts that are read aloud to them.

CONFIDENTIAL DRAFT

Observing craft and structure

Core Standards — Students can and do:

4. Identify the meanings of words and phrases as they are used in the text.
5. Identify important parts or sections of texts.
6. Compare and contrast characters or events from different stories.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. identify words and phrases that suggest feelings or appeal to the senses
b. identify similarities in beginning and ending sounds of words in children's poems and songs
c. identify parts of a story and parts of a poem as well as sections of informational picture books and tell how they are different
d. identify common characteristics of folktales and fairy tales, including their use of rhyme, rhythm, and repetition
e. participate (e.g., react, speculate, read along, act out) when familiar texts are read aloud
f. compare and contrast characters or events from different stories written by the same author or written about similar subjects

Informational Text

a. identify basic text features and what they mean, including titles and subtitles, table of contents, and chapters

Reading Foundations, continued

Phonics and Word Recognition

3. Students know and apply grade-level phonics and word analysis skills in decoding words.
   a. demonstrate basic knowledge of letter-sound correspondences by producing the primary or most frequent sound for each consonant
   b. identify which letters represent the five major vowels and know the long and short sound of each
   c. blend letter-sounds to decode short-vowel CVC words (e.g., *cat, mop, sun*)
   d. read at least 25 very high frequency words by sight (e.g., *of, to, he, she, is, do, does*)

Developing Fluency

4. Students read with sufficient accuracy and fluency to support comprehension.
   a. read rebus and preprimer texts with purpose and understanding
   b. demonstrate increased accuracy and fluency on successive readings of a text

Integrating information and evaluating evidence

Core Standards — Students can and do:

7. Use text illustrations to predict or confirm what the text is about.
8. Identify words in a text that link ideas and events together.
9. Identify who is telling a story or providing information in the text.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. use pictures, illustrations, and context to make predictions about and confirm story content
b. identify words in a story that link events together (e.g., *first/second, then, next, before/after, later, finally*)
c. identify who is the speaker in a story or poem

Informational Text

a. identify words that link ideas together (e.g., *also, in addition, for example, but*)
b. identify the author and sources of information when provided by the text

Developing habits for reading text

Core Standards — Students can and do:

10. Begin to read independently and/or with a partner, sustaining effort necessary to build understanding.

Writing and Research Standards

Writing to reflect audience, purpose, and task

Core Standards — Students can and do:

1. Write narratives, informative and explanatory texts, and opinions that communicate to a familiar, known audience.

Conducting research

Core Standards — Students can and do:

2. Gather information from experiences or provided text sources.

Revising writing

Core Standards — Students can and do:

3. With specific guidance, add details to strengthen writing through revision.

Using tools and technology

Core Standards — Students can and do:

4. Gain familiarity with technology and other tools to produce, revise, and edit writing.

Standards — Students can and do (by key text type):[6]

Narratives

a. establish a situation in time and/or place
b. recount several loosely linked actions in a short, familiar event, controlling for chronological order
c. provide a reaction to what happened

Informative and Explanatory Texts

a. establish the topic in a title or first sentence
b. supply facts and information relevant to the topic

Arguments (opinions)

a. introduce the topic directly, or use the title of a book when writing about a text
b. express preferences or opinions (e.g., *My favorite book is . . .*) relevant to the topic
c. provide a reason for preference or opinion (e.g., *It reminded me of when I met my friend Carlos*)
d. use linking words that express causality (e.g., *I like . . . because . . .*)

Speaking and Listening Standards

Listening closely and participating productively

Core Standards — Students can and do:

1. Participate productively in group activities requiring speaking and listening.
2. Listen closely to and sustain attention on texts read aloud as well as other sources of information presented orally, visually, or multi-modally and confirm understanding by restating the information and answering pertinent questions.

Standards — Students can and do (by key communication type):

Classroom discussions and participating productively

a. initiate and participate in conversations with peers and adults through multiple exchanges, attending to the comments of others
b. confirm understanding by restating information or answering questions about what has been discussed
c. ask questions to get information, ask for help, or clarify something that is not understood
d. follow norms for conversation, such as listening to others and taking turns to speak

Exchanging information and speaking effectively

Core Standards — Students can and do:

[6] See Appendix D for samples of student writing that illustrate through annotations the level of quality required to meet the writing standards.

3. Share experiences and ideas that demonstrate an awareness of their listeners.
4. Speak audibly and clearly.

Standards — Students can and do (by key communication type):

Presentation of ideas and information

a. describe people, places, things, and events with relevant facts and examples
b. recite or read aloud poems, rhymes, songs, and stories, speaking clearly at an understandable pace

Language Development Standards

Conventions

In kindergarten, students learn to form letters and words in print and to relate sounds (phonemes) to one or more letters. They understand the notion of a sentence, that a sentence performs one of a few basic functions (make a statement, ask a question, or issue a command), and that end punctuation can signal the sentence's function or intensity. With prompting and assistance, they form and expand basic sentences in order to express thoughts, beginning the sentence with a capital letter. Students have a sense of what a noun is, of what singular and plural nouns are, and of how plural nouns are often formed. They also know how to use the most frequently occurring prepositions.

Key Terms: exclamation point, capital/uppercase and lowercase letter, singular and plural noun, period, punctuation, question mark, sentence

Conventions of language and writing

Core Standards — Students can and do:

1. Print all upper- and lowercase letters.
2. Write a letter or letters for each consonant and short-vowel sound (phoneme).

Grammar and usage

Core Standards — Students can and do:

3. Produce and expand complete sentences in shared writing and language activities.
4. Use and understand question words (e.g., *what, where, when, who, which, how*).
5. Form regular plural nouns by adding /s/ or /es/ (e.g., *dog, dogs; wish, wishes; baby, babies*).
6. Demonstrate understanding of the most frequently occurring prepositions (e.g., *to/from, in/out, on/off, for, of, by, with*).

Mechanics

Core Standards — Students can and do:

7. Capitalize the first word in a sentence and the pronoun *I*.
8. Identify end punctuation, including periods, question marks, and exclamation points.

9. Spell simple words phonetically using knowledge of sound-letter relationships.

Vocabulary

Key to students' vocabulary development is building rich and flexible word knowledge marked by multiple connections that link a word to similar words and to contexts and experiences that are related to that word—as compared to simply a definition. In kindergarten, students learn about words in terms of like versus unlike and "similar but not quite the same," using objects and movements as aids. They learn to use descriptive language to distinguish one object from another and order and position words to describe sequences and spatial relationships. They acquire new words through interactive language use, including informal talk, discussion, listening to and responding to texts read aloud as well as by being taught the words directly.

Determining the meaning of words

Core Standards — Students can and do:

1. Sort common objects into categories (e.g., shapes, foods).

Understanding the nuances of words (denotations and connotations)

Core Standards — Students can and do:

2. Act out the meaning of verbs describing the same general action (e.g., *walk, march, strut, prance*) to gain a sense of their different meanings.
3. Demonstrate understanding of common adjectives by relating them to their opposites (antonyms).
4. Use common adjectives to distinguish objects (e.g., the *small blue* square, the *shy white* rabbit).

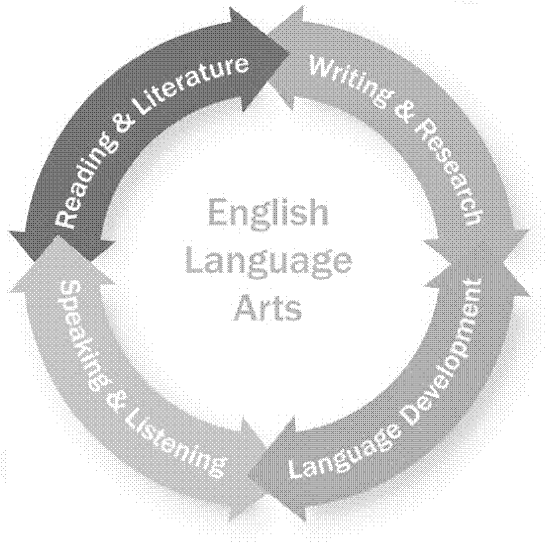
Acquiring vocabulary

Core Standards — Students can and do:

5. Demonstrate meaning of new vocabulary taught directly and gained through conversations and hearing texts read aloud.
6. Demonstrate understanding of words that express order and position (e.g., *first, middle, last; before, after, under, over*).

English Language Arts

Grade 1



Mix of Key Text Types for Grade 1

Narratives	Drama	Poetry	Informational Text
At this level, includes children's adventure stories, biographies, folktales, legends, fables, fantasy, realistic fiction, and myth.	*At this level, includes staged dialogue and brief, familiar scenes.*	*At this level, includes nursery rhymes and the subgenres of narrative poems, limericks, and free verse.*	*At this level, includes books about science, history, and the arts and other nonfiction materials.*

Illustrative Texts for Narratives, Drama, and Poetry[7]

Green Eggs and Ham by Dr. Seuss (1960)

Frog and Toad Together by Arnold Lobel (1971)

Henry and Mudge: The First Book of Their Adventures by Cynthia Rylant, illustrated by Suçie Stevenson (1987)

"Halfway Down" by A. A. Milne (1924)

"It Fell in the City" by Eve Merriam (1986)

Read alouds:

Little House in the Big Woods by Laura Ingalls Wilder, illustrated by Garth Williams (1932)

Zin! Zin! Zin! a Violin by Lloyd Moss, illustrated by Marjorie Priceman (1995)

Illustrative Informational Texts

A Tree Is a Plant by Clyde Robert Bulla, illustrated by Stacey Schuett (text: 1960/illus: 2001)

What Do You Do With a Tail Like This? by Steve Jenkins & Robin Page (2003)

"Our Good Earth" in *National Geographic Young Explorer*, April (2009)

Read alouds:

Follow the Water from Brook to Ocean by Arthur Dorros (1991)

Living Sunlight: How Plants Bring the Earth to Life by Molly Bang & Penny Chisholm, illustrated by Molly Bang (2009)

[7] See Appendix C for other texts illustrative of Kindergarten-Grade 1 text complexity. This list includes read-alouds.

Reading and Literature Standards[8]

Grasping specific details and key ideas

Core Standards — Students can and do:

1. Retell key details and information drawn from the text.
2. Explain the subject of the text or the problem the characters face.
3. Answer questions about characters and events that take place in the text.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. retell the beginnings, middles, and endings of stories
b. ask and answer questions about details of a text
c. identify the problems that characters face in a story and the lessons learned
d. identify the feelings of characters and the reasons for their actions
e. differentiate between realistic and fantastical elements within a story

Informational Text

a. restate key information (e.g., events, subject, ideas) from a text
b. ask and answer questions about details of a text

Reading Foundations

Linguistic Awareness

1. Students gain awareness of spoken words, syllables, and phonemes.
   a. aurally distinguish long from short vowel sounds in spoken single-syllable words (e.g., */ap/* vs. */ape/*; */sock/* vs. */soak/*; */sit/* vs. */sight/*)
   b. produce single-syllable words by orally blending phonemes, including consonant blends (e.g., */cas/*, */black/*, */blast/*)
   c. isolate and pronounce initial, medial vowel, and final phonemes (sounds) in single-syllable words (e.g., *fast*, */a/*, */s/*, */t/*)
   d. orally segment single-syllable words into their complete sequence of individual phonemes

[8] The expectation is that students can fulfill these standards with texts they read independently as well as texts that are read aloud to them.

Observing craft and structure

Core Standards — Students can and do:

4. Identify the meanings of words and phrases as they are used in the text.
5. Identify important parts or sections of texts.
6. Compare and contrast characters or events from different stories.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. identify words and phrases that suggest feelings or appeal to the senses
b. identify similarities in beginning and ending sounds of words in children's poems and songs
c. identify parts of a story and parts of a poem as well as sections of informational picture books and tell how they are different
d. identify common characteristics of folktales and fairy tales, including their use of rhyme, rhythm, and repetition
e. participate (e.g., react, speculate, read along, act out) when familiar texts are read aloud
f. compare and contrast characters or events from different stories written by the same author or written about similar subjects

Informational Text

a. identify basic text features and what they mean, including titles and subtitles, table of contents, and chapters

Reading Foundations, continued

Phonics and Word Recognition

2. Students know and apply grade-level phonics and word analysis skills in decoding words.

a. know the common spelling-sound correspondences for consonants (e.g., *wr*, *sh*, *ck*, *ll*)
b. know vowel digraph and final *e* conventions for representing long vowels
c. know spelling-sound correspondences for diphthongs and other common vowel teams (e.g., *loud*, *cow*, *look*, *loop*, *boy*, *bait*)
d. use knowledge of phonics and spelling conventions to decode regularly spelled one-syllable words (e.g., *sick*, *march*, *sight*, *slice*, *bake*, *spring*)
e. understand that every syllable must have a vowel sound and use that knowledge to determine the number of syllables in a word
f. decode two-syllable words following basic patterns (e.g., *rabbit*, *magnet*, *napkin*, *pickle*, *butter*)
g. read words with inflectional endings (e.g., *-s*, *-es*, *-ies*, *-ed*, *-ied*, *-ing*, *-er*, *-est*)
h. use phonics to decode visually new words when reading
i. recognize grade-appropriate, irregularly spelled words by sight

Integrating information and evaluating evidence

Core Standards — Students can and do:

7. Use text illustrations to predict or confirm what the text is about.
8. Identify words in a text that link ideas and events together.
9. Identify who is telling a story or providing information in the text.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. use pictures, illustrations, and context to make predictions about and confirm story content
b. identify words in a story that link events together (e.g., *first/second*, *then*, *next*, *before/after*, *later*, *finally*)
c. identify who is the speaker in a story or poem

Informational Text

a. identify words that link ideas together (e.g., *also*, *in addition*, *for example*, *but*)
b. identify the author and sources of information when provided by the text

Developing habits for reading text

Core Standards — Students can and do:

10. Begin to read independently and/or with a partner, sustaining effort necessary to build understanding.

Reading Foundations, continued

Developing Fluency

3. Students read with sufficient accuracy and fluency to support comprehension.

a. demonstrate increased accuracy, fluency, and expression on successive readings of a text
b. use context to confirm or self-correct word recognition and understanding, rereading as necessary
c. read aloud, alone, or with a partner at least 15 minutes each day, in school or out

Writing and Research Standards

Writing to reflect audience, purpose, and task

Core Standards — Students can and do:

1. Write narratives, informative and explanatory texts, and opinions that communicate to a familiar, known audience.

Conducting research

Core Standards — Students can and do:

2. Gather information from experiences or provided text sources.

Revising writing

Core Standards — Students can and do:

3. With specific guidance, add details to strengthen writing through revision.

Using tools and technology

Core Standards — Students can and do:

4. Gain familiarity with technology and other tools to produce, revise, and edit writing.

Standards — Students can and do (by key text type):[9]

Narratives

a. establish a situation in time and/or place that is appropriate for the sequence of events to follow
b. develop appropriately sequenced actions within one or more events using linking words, phrases, or clauses to signal chronological ordering
c. provide a reaction to what happened
d. include dialogue if appropriate, and some details
e. provide a sense of closure and/or a reflective statement

Informative and Explanatory Texts

a. include some sort of beginning to establish the topic (beyond using the title of the piece)
b. supply facts and information relevant to the topic
c. use simple additive linking words (e.g., *and*, *first*, *second*) to create connections between the facts
d. provide examples relevant to the topic
e. provide a sense of closure

Arguments (opinions)

a. introduce the topic or book directly, or use the title of the book as an introduction
b. state opinions (e.g., *My best friend is . . .*) relevant to the topic
c. provide reasons for opinions and details to support them

[9] See Appendix C for samples of student writing that illustrate through annotations the level of quality required to meet the writing standards.

d. use linking words that express causality (e.g., *I like . . . because . . .*)
e. refer to the content of the text when writing about literature

Speaking and Listening Standards

Listening closely and participating productively

Core Standards — Students can and do:

1. Participate productively in group activities requiring speaking and listening.
2. Listen closely to and sustain attention on texts read aloud as well as other sources of information presented orally, visually, or multi-modally and confirm understanding by restating the information and answering pertinent questions.

Standards — Students can and do (by key communication type):

Classroom discussions and participating productively

a. initiate and participate in conversations with peers and adults through multiple exchanges, attending to the comments of others
b. confirm understanding by restating information or answering questions about what has been discussed
c. ask questions to get information, ask for help, or clarify something that is not understood
d. follow norms for conversation, such as listening to others and taking turns to speak

Exchanging information and speaking effectively

Core Standards — Students can and do:

3. Share experiences and ideas that demonstrate an awareness of their listeners.
4. Speak audibly and clearly.

Standards — Students can and do (by key communication type):

Presentation of ideas and information

a. describe people, places, things, and events with relevant facts and examples
b. recite or read aloud poems, rhymes, songs, and stories, speaking clearly at an understandable pace

Language Development Standards

Conventions

In grade 1, students gain increasing skill and independence in sentence formation and development. They have a sense of what a verb is and that its form changes to signal different time periods (past, present, and future). Their repertoire of prepositions continues to expand, and they use pronouns with regularity. Students capitalize names, places, and dates. They use end punctuation as well as commas in dates and in simple series of words. Their range of word-formation and spelling strategies grows.

Key Terms: comma, pronoun, verb

Grammar and usage

Core Standards — Students can and do:

1. Produce and expand complete sentences in response to questions and prompts.
2. Use subject, object, and possessive pronouns (e.g., *I*, *me*, *my*; *they*, *them*, *their*).
3. Use verbs to convey a sense of past, present, and future in writing and speaking (e.g., *Today I walk home*; *Yesterday I walked home*; *Tomorrow I will walk home*).
4. Demonstrate understanding of frequently occurring prepositions (e.g., *during*, *beyond*, *toward*).

Mechanics

Core Standards — Students can and do:

5. Capitalize names, places, and dates.
6. Use end punctuation for sentences, including periods, question marks, and exclamation points.
7. Use commas in dates and to separate single words in a series.
8. Form new words through addition, deletion, and substitution of sound and letters (e.g., *an* → *man* → *mat* → *mast* → *must* → *rust* → *crust*).
9. Use conventional spelling for words with common spelling patterns and common irregular words.
10. Use phonetic spellings for untaught words, drawing on phonemic awareness and spelling conventions.

Vocabulary

Key to students' vocabulary development is building rich and flexible word knowledge marked by multiple connections that link a word to similar words and to contexts and experiences that are related to that word—as compared to simply a definition. In grade 1, students begin to sort words themselves into categories rather than the objects that they name. They are able to define familiar words (e.g., *duck*) in a two-step process of identifying a category (bird) to which it belongs and naming one or more attributes that distinguish this category member from others (able to swim). Students grasp that many words they know can mean different things depending on how the word is used, and they make distinctions between and among closely related verbs and adjectives in terms of manner and intensity. They acquire new words through interactive language use, including informal talk, discussion, listening to and responding to texts read aloud as well as by being taught the words direct.

Determining the meaning of words

Core Standards — Students can and do:

1. Sort words into categories (e.g., colors, clothing).
2. Define words by category and by one or more key attributes (e.g., a *duck* is a bird that swims; a *tiger* is a large cat with stripes).
3. Demonstrate understanding of the concept of multiple-meaning words (e.g., *match*, *kind*, *play*) by identifying various meanings of some grade-appropriate examples of such words.

Understanding the nuances of words (denotations and connotations)

Core Standards — Students can and do:

4. Define, choose, or act out the meaning of closely related verbs that differ in manner (e.g., *look*, *peek*, *glance*, *stare*, *glare*, *scowl*; *speak*, *shout*, *mumble*, *whine*, *whimper*, *murmur*).
5. Distinguish among closely related adjectives that differ in intensity (e.g., *large*, *gigantic*; *hot*, *scalding*; *tasty*, *delicious*; *quiet*, *silent*).

Acquiring vocabulary

Core Standards — Students can and do:

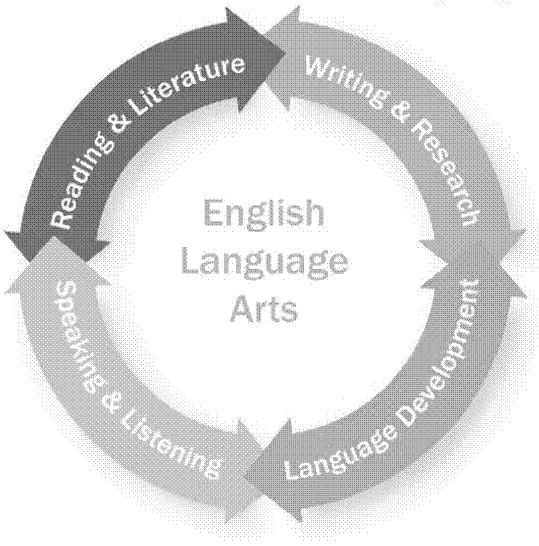
6. Acquire and use new vocabulary taught directly and gained through conversations and hearing texts read aloud.

CONFIDENTIAL DRAFT

CONFIDENTIAL

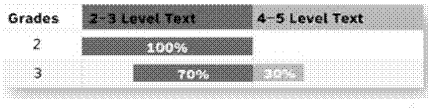
English Language Arts

Grade 2



Required Text Complexity by Grade

Proportion of Texts Within and Above Grade Band to be Read in Each Grade



While advancing through the grades, students must engage with texts of steadily increasing complexity.

- **In grade 2**, students focus on reading texts in the 2–3 grade band level with scaffolding likely required for texts at the high end of the range.

Determining Text Complexity for Grades 2–3

Text complexity is determined by a mix of qualitative and quantitative measures of the text itself refined by teachers professional judgment about the match of particular texts to particular students. The qualitative dimensions of text complexity are best understood as continua of increasing complexity rather than as representing discrete and easily defined stages. Most authentic texts will exhibit some but not all of the traits linked to a particular grade band; qualitatively assigning a text to a grade band is therefore a matter of "best fit," or determining which grade band's set of descriptors most accurately describes the text.

Qualitative Measures of Texts[10]	Quantitative Measures of Texts
• *Structure:* Explicit, simple, conventional, simple graphic representations are supplementary to meaning; texts are relatively short • *Purpose:* Single, explicitly stated • *Style and Language:* Familiar, accessible, plain; few literary devices; mostly clear, everyday language; limited use of Tier 2 and 3 words and figurative language • *Richness:* A few ideas/concepts; concrete; low information density • *Relationships:* A few connections; explicit • *Knowledge Demands:* Ability to handle simple themes and fantastical elements as well as draw upon common, everyday experiences; general background knowledge and familiarity with genre conventions required; some everyday and general content knowledge	A study is underway with Coh-Metrix, a nonprofit research organization, to identify roughly five to seven computer-measurable dimensions of text cohesion. These dimensions, paired with a Lexile score, will yield a robust quantitative assessment of text complexity that, along with both the qualitative dimensions and professional judgment, will round out the Core Standards model of complexity.
Professional Judgment that weighs students' prior knowledge and life experiences as well as their interests, motivations, and maturity level.	

[10] Adapted from ACT, Inc., (2005); Carnegie Council on Advancing Adolescent Literacy (2010); Chall, Bissex, Conrad, & Harris-Sharples (1996); and Hess and Biggam (2004)

Mix of Key Text Types for Grade 2

Narratives	Drama	Poetry	Informational Text
At this level, includes children's adventure stories, biographies, folktales, legends, fables, fantasy, realistic fiction, and myth.	*At this level, includes staged dialogue, scenes, and brief, familiar scenes.*	*At this level, includes nursery rhymes and the subgenres of narrative poems, limericks, and free verse.*	*At this level, includes books about science, history, and the arts and other nonfiction materials.*

Illustrative Texts for Narratives, Drama, and Poetry[11]

Crow Boy by Taro Yashima (1955)

The Stories Julian Tells by Ann Cameron (1981)

Tops and Bottoms by Janet Stevens (1995)

"Grandpa's Stories" by Langston Hughes (1958)

"Weather" by Eve Merriam (1969)

Read alouds:

The Cricket in Times Square by George Selden, illustrated by Garth Williams (1960)

"Fireflies" by Paul Fleischman, illustrated by Eric Beddows (1988)

Illustrative Informational Texts

Maps & Globes by Jack Knowlton, pictures by Harriet Barton (1985)

Sunshine Makes the Seasons by Franklyn M. Branley (1985)

From Seed to Plant by Gail Gibbons (1991)

Boy, Were We Wrong About Dinosaurs by Kathleen V. Kudlinski, illustrated by S.D. Schindler (2005)

[11] See Appendix B for other texts illustrative of Grades 2-3 text complexity.

Reading and Literature Standards

Grasping specific details and key ideas

Core Standards — Students can and do:

1. Retell what the text says explicitly and make inferences required to understand the text.
2. Identify the lessons or topics of the text and the key details that support them.
3. Describe in detail a specific character, event, or topic in the text.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. ask and answer clarifying questions (e.g., how, why, where, when, who, and what) concerning specific details in the text and refer explicitly to parts of a text to answer these questions
b. identify or infer the moral or lesson in well-known stories, fables, folktales, or myths
c. describe how major events in a story often lead from problem to solution
d. examine a specific incident in a story, narrative, or drama in depth and establish when, where, and why it occurs
e. describe characters based upon what they say and do

Informational Text

a. accurately restate the key information provided by the text
b. ask and answer clarifying questions (e.g., how, why, and what) concerning specific details in the text and refer explicitly to parts of a text to answer these questions
c. identify the main idea and supporting details and facts in a text
d. explain the topic of each paragraph in a multi-paragraph text
e. identify specific events in historical or scientific texts and discuss what happened, as well as where, when, and why it happened, according to facts taken from the text

Reading Foundations

Phonics and Word Recognition

1. Students know and apply grade-level phonics and word analysis skills in decoding words.
   a. know the common spelling-sound correspondences for consonants (e.g., *wr-*, *sh*, *-ck*, *-ll*)
   b. know vowel digraph and final-e conventions for representing long vowels
   c. know spelling-sound correspondences for diphthongs and other common vowel teams (e.g., *loud*, *cow*, *book*, *loop*, *boy*, *boil*)
   d. use knowledge of phonics and spelling conventions to decode regularly spelled one-syllable words (e.g., *sick*, *march*, *sight*, *slice*, *bake*, *spring*)

Observing craft and structure

Core Standards — Students can and do:

4. Explain the meanings of words and phrases as they are used in the text.
5. Gain familiarity with different ways of presenting stories and information in text.
6. Compare and contrast different versions of the same story or informational texts on the same subject.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. recognize sensory details and how they are used to describe events, feelings, and objects
b. describe the different ways poets use rhyme, rhythm, and sensory images to convey a topic or message
c. identify repetitions in phrases, refrains, or sounds in poems and songs
d. describe story elements, including characters, setting, the problem, and how it is resolved
e. discuss stories written by the same author about similar characters or compare different versions of similar well-known tales and myths from various cultures

Informational Text

a. locate key words, facts, or other details using features of texts (e.g., captions, headings, glossaries, indexes, electronic menus, and icons)
b. distinguish between writing that is based on real events and writing that is based on fantasy or fictional events
c. combine information from two different parts of a text and identify how they are related (e.g., chronology, causation)
d. after reading two passages on the same subject, combine the information to more fully describe a topic

Reading Foundations, continued

Developing Fluency

2. Students read with sufficient accuracy and fluency to support comprehension.
   a. demonstrate increased accuracy, fluency, and expression on successive readings of a text
   b. use context to confirm or self-correct word recognition and understanding, rereading as necessary
   c. read alone or with a partner at least 20 minutes each day, in school or out

Integrating information and evaluating evidence

Core Standards — Students can and do:

7. Locate and use information from graphs, illustrations, and electronic sources.
8. Identify and understand words and phrases that indicate logical relationships.
9. Identify who is telling the story or providing information at any given point in the text.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. efficiently navigate stories in print and electronic text and explain how images and illustrations connect to and clarify the content
b. identify who is telling the story or who is speaking in a drama

Informational Text

a. use information from visual elements of print and electronic texts (e.g., graphs, maps, charts, illustrations, photographs, diagrams) and explain how they help a reader understand the text
b. identify words (e.g., *such as*, *because*, *therefore*, *in order to*, *since*) that logically connect ideas in sentences and paragraphs

Developing habits for reading complex text

Core Standards — Students can and do:

10. Develop the habit of reading independently and productively, sustaining concentration and stamina to read increasingly demanding text.

Writing and Research Standards

Writing to reflect audience, purpose, and task

Core Standards — Students can and do:

1. Write narratives, informative and explanatory texts, and opinions that communicate to a familiar, known audience.

Conducting research

Core Standards — Students can and do:

2. Gather information from experiences or provided text sources.

Revising writing

Core Standards — Students can and do:

3. With specific guidance, strengthen writing through revision.

Using tools and technology

Core Standards — Students can and do:

4. Gain familiarity with technology and other tools to produce, revise, and edit writing.

Standards — Students can and do (by key text type):[12]

Narratives

a. establish a situation in time and/or place that is appropriate for the sequence of events to follow
b. recount a single well-elaborated event or sequence of events, managing chronological sequence with temporal words, phrases, and clauses
c. tell what the narrator thought or felt
d. include dialogue if appropriate and specific details
e. provide closure through reaction, commentary, or summation

Informative and Explanatory Texts

a. produce a brief introduction
b. create an organizational structure that presents similar information together, frequently patterned after chapter book headings or picture books
c. use adequate and specific facts and definitions to develop points
d. use linking words, such as *also*, *another*, *and*, and *more*, to connect ideas within categories of information, and headers to signal groupings
e. include a concluding sentence or section

Arguments (opinions)

a. introduce the topic or book(s) directly
b. state opinion(s) relative to the topic
c. provide reasons for opinions and details to support them
d. create a list-like structure for organization
e. use words to link and organize opinions and reason(s) (e.g., *because*, *another*, *and*, *also*)
f. refer to the text(s) when writing about literature
g. close with a concluding statement or recommendation

Speaking and Listening Standards

Listening closely and participating productively

Core Standards — Students can and do:

1. Participate productively in small groups and as a class, engaging in a series of oral exchanges about texts and topics.

[12] See Appendix C for samples of student writing that illustrate through annotations the level of quality required to meet the writing standards.

2. Sustain concentration on information presented orally, visually, or multi-modally and confirm understanding by paraphrasing the information.

Standards — Students can and do (by key communication type):

Classroom discussions and participating productively

a. engage in conversations on familiar topics
b. paraphrase the key information or ideas of others presented orally or through other media
c. inquire about oral or visual presentations to deepen understanding or clarify comprehension
d. link additions to conversation to the previous remarks of others
e. participate productively by listening politely to the ideas of others, taking turns speaking, and extending their ideas in light of discussions

Exchanging information and speaking effectively

Core Standards — Students can and do:

3. Share experiences and ideas, thinking about the needs of their listeners.
4. Speak audibly and clearly at an understandable pace.

Standards — Students can and do (by key communication type):

Presentation of ideas and information

a. recount stories or experiences with descriptive details by answering who, what, where, when, how, and why questions about them
b. report on a topic, including appropriate facts and details
c. use appropriate tone to express ideas, feelings, and needs clearly
d. recite or read aloud poems, rhymes, songs, and stories, speaking clearly at an understandable pace

Language Development Standards

Conventions

In grade 2, students create sentences of expanding length and complexity, though their control over these sentences is likely to be imperfect. Their command of noun and verb formation extends to common irregular forms. Students capitalize correctly in most situations. Their use of punctuation has grown to include commas in greetings and closings of letters as well as apostrophes to form contractions and to signal possession. Their spelling is increasingly conventional, and they now consult references, such as beginning dictionaries, to aid them when needed.

Key Terms: apostrophe, contraction, regular and irregular nouns and verb, possessive

Grammar and usage

Core Standards — Students can and do:

1. Generate and expand sentences with embedded, dependent, or conjoined clauses (e.g., *After we came home from school, I fed the gerbil and my sister cleaned the cage*).
2. Form common irregular plural nouns (e.g., *feet, children, teeth, mice, fish, women*).

3. Form the past tense of common irregular verbs (e.g., *sat, hid, told*).

Mechanics

Core Standards — Students can and do:

4. Capitalize holidays, product names, geographic names, and important words in titles.
5. Use commas in greetings and closings of letters.
6. Use apostrophes to punctuate contractions and to form common possessives.
7. Use conventional spelling for high-frequency and other studied words.
8. Generalize learned spelling patterns when writing words (e.g., *cage* → *badge; boy* → *boil; paper* → *copper*).
9. Use spelling rules for adding suffixes to base words (e.g., *sitting, smiled, cries, happiness*).
10. Consult reference materials, including beginning dictionaries, to check and correct spellings.

Vocabulary

In grade 2, students use a repertoire of strategies for dealing with unknown words. They can analyze the word itself, consider how it is used, consult reference materials, use the components of a compound word as clues to the word's meaning, or employ some combination of these strategies to determine or clarify word meanings. They figure out which meaning of a multiple-meaning word is most likely intended in a particular circumstance, and they differentiate among the connotations of related verbs and adjectives. They acquire new words through interactive language use, including informal talk, discussion, reading and responding to text as well as by being taught the words directly.

Determining the meaning of words

Core Standards — Students can and do:

1. Determine or clarify the meaning of an unknown word by using one or more of the following strategies:
   - identifying its base word when it has affixes (e.g., *happiness, finally, grimy, busily*)
   - determining how it is used in a sentence when reading, including whether it names or describes a thing or an action
   - consulting reference materials, including glossaries and beginning dictionaries, both print and digital
2. Determine the relevant meaning of multiple-meaning words by using context.
3. Explain the meaning of grade-appropriate compound words (e.g., *birdhouse, lighthouse, housefly; bookshelf, notebook, bookmark*).

Understanding the nuances of words (denotations and connotations)

Core Standards — Students can and do:

4. Distinguish among related verbs (e.g., *toss, throw, hurl*) to gain a sense of their shadings of meaning.
5. Distinguish among related adjectives (e.g., *thin, slender, skinny, scrawny; irritated, mad, angry, furious*) to gain a sense of their shadings of meaning.

Acquiring vocabulary

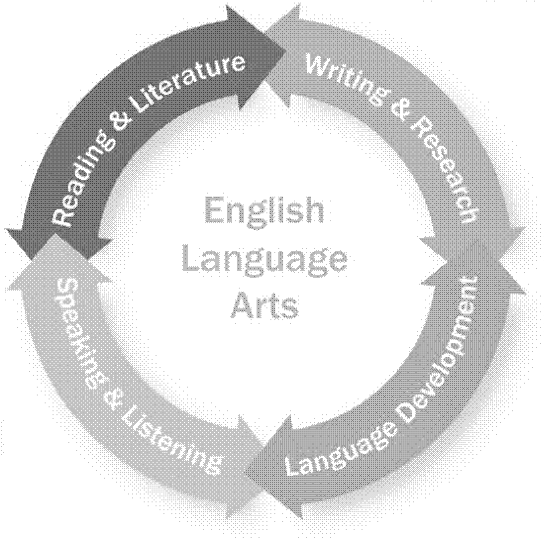
Core Standards — Students can and do:

6. Acquire and use new vocabulary taught directly and gained through reading and conversations.

CONFIDENTIAL

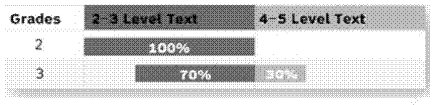
English Language Arts

Grade 3



Required Text Complexity by Grade

Proportion of Texts Within and Above Grade Band to be Read in Each Grade



While advancing through the grades, students must engage with texts of steadily increasing complexity.

- **In grade 3**, students focus on reading texts in the 2–3 grade band level text (70 percent) independently and are introduced to texts in the 4–5 grade band level as "stretch" texts (30 percent), which will likely require scaffolding.

Determining Text Complexity for Grades 2–3

Text complexity is determined by a mix of qualitative and quantitative measures of the text itself refined by teachers' professional judgment about the match of particular texts to particular students. The qualitative dimensions of text complexity are best understood as continua of increasing complexity rather than as representing discrete and easily defined stages. Most authentic texts will exhibit some but not all of the traits linked to a particular grade band; qualitatively assigning a text to a grade band is therefore a matter of "best fit," or determining which grade band's set of descriptors most accurately describes the text.

Qualitative Measures of Texts[13]	Quantitative Measures of Texts
• *Structure:* Explicit, simple, conventional; simple graphic representations are supplementary to meaning; texts are relatively short • *Purpose:* Single; explicitly stated • *Style and Language:* Familiar, accessible, plain; few literary devices; mostly clear, everyday language; limited use of Tier 2 and 3 words and figurative language • *Richness:* A few ideas/concepts; concrete; low information density • *Relationships:* A few connections; explicit • *Knowledge Demands:* Ability to handle simple themes and fantastical elements as well as draw upon common, everyday experiences; general background knowledge and familiarity with genre conventions required; some everyday and general content knowledge	A study is underway with Cob-Metrix, a nonprofit research organization, to identify roughly five to seven computer-measurable dimensions of text cohesion. These dimensions, paired with a Lexile score, will yield a robust quantitative assessment of text complexity that, along with both the qualitative dimensions and professional judgment, will round out the Core Standards model of complexity.
Professional Judgment that weighs students' prior knowledge and life experiences as well as their interests, motivations, and maturity level.	

[13] Adapted from ACT, Inc., (2005); Carnegie Council on Advancing Adolescent Literacy (2010); Chall, Bissex, Conrad, & Harris-Sharples (1996); and Hess and Biggam (2004)

Mix of Key Text Types for Grade 3

Narratives	Drama	Poetry	Informational Text
At this level, includes children's adventure stories, biographies, folktales, legends, fables, fantasy, realistic fiction, and myth.	*At this level, includes staged dialogue, scenes, and brief familiar scenes.*	*At this level, includes nursery rhymes, and the subgenres of narrative poems, limericks, and free verse.*	*At this level, includes books about science, history, and the arts and other nonfiction materials.*

Illustrative Texts for Narratives, Drama, and Poetry[14]

My Father's Dragon by Ruth Stiles Gannett, illustrated by Ruth Chrisman Gannett (1948)

Sarah, Plain and Tall by Patricia MacLachlan (1985)

The One-Eyed Giant (Book One of Tales from the Odyssey) by Mary Pope Osborne (2002)

"Knoxville, Tennessee" by Nikki Giovanni (1968)

"Eating While Reading" by Gary Soto (1995)

Read Alouds:

"How the Camel Got His Hump" in *Just So Stories* by Rudyard Kipling (1902)

Illustrative Informational Text

A Medieval Feast by Aliki (1983)

So You Want to Be President? by Judith St.George, illustrated by David Small (2000)

Bat Loves the Night by Nicola Davies, illustrated by Sarah Fox-Davies (2008)

Moonshot: The Flight of Apollo 11 by Brian Floca (2009)

[14] See Appendix B for other texts illustrative of Grades 2-3 text complexity.

Reading and Literature Standards

Grasping specific details and key ideas

Core Standards — Students can and do:

1. Retell what the text says explicitly and make inferences required to understand the text.
2. Identify lessons or topics of the text and the key details that support them.
3. Describe in detail a specific character, event, or topic in the text.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. ask and answer clarifying questions (e.g., how, why, where, when, who, and what) concerning specific details in the text and refer explicitly to parts of a text to answer these questions
b. identify or infer the moral or lesson in well-known stories, fables, folktales, or myths
c. describe how major events in a story often lead from problem to solution
d. examine a specific incident in a story, narrative, or drama in depth, and establish when, where, and why it occurs
e. describe characters based upon what they say and do

Informational Text

a. accurately restate key information provided by the text
b. ask and answer clarifying questions (e.g., how, why, and what) concerning specific details in the text and refer explicitly to parts of a text to answer these questions
c. identify the main idea and supporting details and facts in a text
d. explain the topic of each paragraph in a multi-paragraph text
e. identify specific events in historical or scientific texts and discuss what happened, as well as where, when, and why it happened, according to facts taken from the text

Reading Foundations

Phonics and Word Recognition

1. Students know and apply grade-level phonics and word analysis skills in decoding words.
   a. identify and know the meaning of the most common prefixes and derivational suffixes (e.g., *un-*, *re-*, *mis-*, *-ful*, *-tion*, *-able*)
   b. decode regularly spelled single-syllable and multi-syllable words (e.g., *vocabulary*, *refrigerator*, *terrible*, *frightening*)
   c. read grade-appropriate irregularly spelled words by sight
   d. use phonics and word analysis to identify visually new words when reading

Observing craft and structure

Core Standards — Students can and do:

4. Explain the meanings of words and phrases as they are used in the text.
5. Gain familiarity with different ways of presenting stories and information in text.
6. Compare and contrast different versions of the same story or informational texts on the same subject.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. recognize sensory details and how they are used to describe events, feelings, and objects
b. describe the different ways poets use rhyme, rhythm, and sensory images to convey a topic or message
c. identify repetitions in phrases, refrains, or sounds in poems and songs
d. describe story elements, including characters, setting, the problem, and how it is resolved
e. discuss stories written by the same author about similar characters or compare different versions of similar well-known tales and myths from various cultures

Informational Text

a. locate key words, facts, or other details using features of texts (e.g., captions, headings, glossaries, indexes, electronic menus, and icons)
b. distinguish between writing that is based on real events and writing that is based on fantasy or fictional events
c. combine information from two different parts of a text and identify how they are related (e.g., chronology, causation)
d. after reading two passages on the same subject, combine the information to more fully describe a topic

Integrating information and evaluating evidence

Core Standards — Students can and do:

7. Locate and use information from graphs, illustrations, and electronic sources.
8. Identify and understand words and phrases that indicate logical relationships.
9. Identify who is telling the story or providing information at any given point in the text.

Reading Foundations, continued

Developing Fluency

2. Students read with sufficient accuracy and fluency to support comprehension.
   a. demonstrate increased accuracy, fluency, and expression on successive readings of a text
   b. use context to confirm or self-correct word recognition and understanding, rereading as necessary
   c. read at least 20 minutes each day, in school or out

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. efficiently navigate stories in print and electronic text and explain how images and illustrations connect to and clarify the content
b. identify who is telling the story or who is speaking in a drama

Informational Text

a. use information from visual elements of print and electronic texts (e.g., graphs, maps, charts, illustrations, photographs, diagrams) and explain how they help a reader understand the text
b. identify words (e.g., *such as*, *because*, *therefore*, *in order to*, *since*) that logically connect ideas in sentences and paragraphs

Developing habits for reading complex text

Core Standards — Students can and do:

10. Develop the habit of reading independently and productively, sustaining concentration and stamina to read increasingly demanding text.

Writing and Research Standards

Writing to reflect audience, purpose, and task

Core Standards — Students can and do:

1. Write narratives, informative and explanatory texts, and opinions that communicate to a familiar, known audience.

Conducting research

Core Standards — Students can and do:

2. Gather information from experiences or provided text sources.

Revising writing

Core Standards — Students can and do:

3. With specific guidance, strengthen writing through revision.

Using tools and technology

Core Standards — Students can and do:

4. Gain familiarity with technology and other tools to produce, revise, and edit writing.

Standards — Students can and do (by key text type):[15]

Narratives

a. set the time, indicate a location, introduce characters, or enter immediately into the story line to engage the reader
b. recount a single, well-elaborated event or a sequence of events that unfold naturally using temporal words, phrases, and clauses
c. tell what the narrator thought or felt
d. develop a focus, provide pacing, and include only relevant information
e. develop a character through the description of external behavior
f. provide descriptive details
g. employ dialogue and other narrative strategies
h. provide a satisfying conclusion that is reflective and/or that effectively ties up loose ends

Informative and Explanatory Texts

a. produce an introduction that names the topic and provides at least one general detail about it
b. create an organizational structure that presents similar information together, frequently patterned after chapter book headings or picture books
c. use adequate, relevant, and specific facts and definitions to develop points
d. logically categorize details and facts drawn from personal experience and other sources
e. use linking words, such as *also*, *another*, *and*, and *more*, to connect ideas within categories of information, and use headers to signal groupings
f. include only appropriate information
g. include a concluding sentence or section

Arguments (opinions)

a. introduce the topic or book(s) directly, and attempt to capture the reader's interest
b. state an opinion relative to the topic (e.g., *This is a good book* or *John is a good friend*)
c. provide facts and details to support the opinion
d. create a list-like organizing structure that provides reasons for the opinion
e. use appropriate words to link and organize opinions and reason(s) (e.g., *because*, *another*, *and*, *also*)
f. refer to the text(s) when writing about literature
g. provide a concluding statement, reflection, and/or recommendation

[15] See Appendix C for samples of student writing that illustrate through annotations the level of quality required to meet the writing standards.

Speaking and Listening Standards

Listening critically and participating productively

Core Standards — Students can and do:

1. Participate productively in small groups and as a class, engaging in a series of oral exchanges about texts and topics.
2. Sustain concentration on information presented orally, visually, or multi-modally and confirm understanding by paraphrasing the information.

Standards — Students can and do (by key communication type):

Classroom discussions and participating productively

a. engage in conversations on familiar topics
b. paraphrase the key information or ideas of others presented orally or through other media
c. inquire about oral or visual presentations to deepen understanding or clarify comprehension
d. link additions to conversation to the previous remarks of others
e. participate productively by listening politely to the ideas of others, taking turns speaking, and extending their ideas in light of discussions

Exchanging information and speaking effectively

Core Standards — Students can and do:

3. Share experiences and ideas, thinking about the needs of their listeners.
4. Speak audibly and clearly at an understandable pace.

Standards — Students can and do (by key communication type):

Presentation of ideas and information

a. recount stories or experiences with descriptive details by answering who, what, where, when, how, and why questions about them
b. report on a topic, including appropriate facts and details
c. use appropriate tone to express ideas, feelings, and needs clearly
d. recite or read aloud poems, rhymes, songs, and stories, speaking clearly at an understandable pace

Language Development Standards

Conventions

By grade 3, students have learned the foundations of written and spoken language, including letter, word, and sentence formation and crucial forms of punctuation. They ensure agreement between subject and verb and between pronoun and antecedent in simple situations. Students use quotation marks to indicate dialogue. They know most of the conventions of spelling and consult references to look up words when they still have difficulty. They use precise everyday language to describe and begin to consider the effects of word choice in writing and speaking.

Key Terms: subject-verb and pronoun-antecedent agreement, comma splice, fragment, run-on, quotation mark

Conventions of language and writing

Core Standards — Students can and do:

1. Group related ideas into a paragraph.

Grammar and usage

Core Standards — Students can and do:

2. Generate complete sentences, avoiding fragments, comma splices, and run-ons.*
3. Ensure subject-verb and pronoun-antecedent agreement.*

Mechanics

Core Standards — Students can and do:

4. Use quotation marks in dialogue.
5. Use spelling patterns and generalizations (e.g., word families, position-based spellings, syllable patterns, ending rules, meaningful word parts) in writing regular words.
6. Consult reference materials, including dictionaries, to check and correct spellings.

Word choice and style

Core Standards — Students can and do:

7. Use precise everyday language.
8. Choose words for effect.*[16]

[16] Conventions standards noted with an asterisk (*) need to be revisited by students in subsequent grades. See Appendix A for a full listing.

Vocabulary

Key to students' vocabulary development is building rich and flexible word knowledge marked by multiple connections that link a word to similar words and to contexts and experiences that are related to that word—as compared to simply a definition. In grade 3, students use their repertoire of strategies to determine and clarify the meaning of unknown and multiple-meaning words. They know that words are sometimes used in nonliteral ways and can use that knowledge to help them understand common idioms. They learn and can paraphrase many common idioms and sayings. They recognize that words have nuances in meaning and rely on context and background knowledge to sort among related words that describe abstract concepts. They acquire new words through interactive language use, including informal talk, discussion, reading and responding to text as well as by being taught the words directly.

Determining the meaning of words

Core Standards — Students can and do:

1. Determine or clarify the meaning of an unknown word by using one or more of the following strategies:
   - using prefixes and suffixes when it is a multimorpheme word (e.g., *thoughtless, recycle, unforgettable*)
   - determining how it is used in a sentence when reading
   - consulting reference materials, including glossaries and dictionaries, both print and digital
2. Determine the meaning of multiple-meaning words by using context.
3. Distinguish between literal and nonliteral uses of language.
4. Paraphrase the meaning of common idioms and sayings.

Understanding the nuances of words (denotations and connotations)

Core Standards — Students can and do:

5. Distinguish among related words that describe states of mind, degrees of certainty, or other abstract concepts (e.g., *knew, believed, suspected, heard, wondered*).

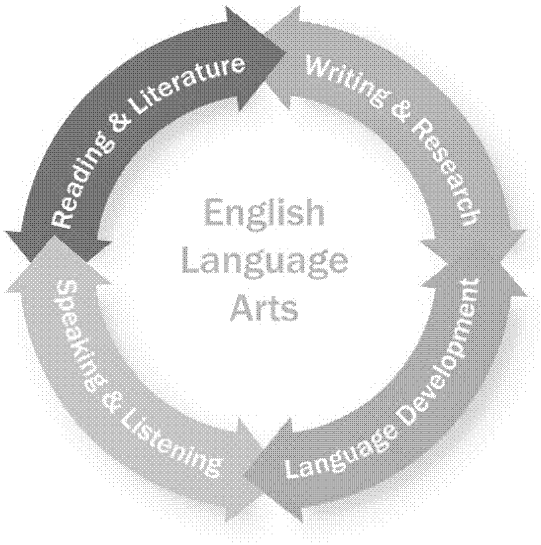
Acquiring vocabulary

Core Standards — Students can and do:

6. Acquire and use new vocabulary taught directly and gained through reading and conversations.

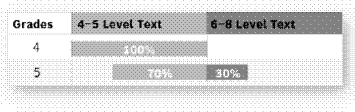
English Language Arts

Grades 4–5



Required Text Complexity by Grade

Proportion of Texts Within and Above Grade Band to be Read in Each Grade



While advancing through grades 4–5, students must engage with texts of steadily increasing complexity.

- **In grade 4**, students focus on reading texts in the 4–5 grade band level with scaffolding likely required for texts at the high end of the range.
- **In grade 5**, students focus on reading in the 4–5 grade band level (70 percent) independently and are introduced to texts in the 6–8 grade band level as "stretch" texts (30 percent), which will likely require scaffolding.

Determining Text Complexity for Grades 4–5[17]

Text complexity is determined by a mix of qualitative and quantitative measures of the text itself refined by teachers' professional judgment about the match of particular texts to particular students. The qualitative dimensions of text complexity are best understood as continua of increasing complexity rather than as representing discrete and easily defined stages. Most authentic texts will exhibit some but not all of the traits linked to a particular grade band; qualitatively assigning a text to a grade band is therefore a matter of "best fit," or determining which grade band's set of descriptors most accurately describes the text.

Qualitative Measures of Texts	Quantitative Measures of Texts
• *Structure:* Largely explicit and direct; graphic representations are supplementary to meaning; texts are of increasing length • *Purpose:* Single or twofold; clearly indicated • *Style and Language:* Moderately accessible; some literary devices; some everyday language; some use of Tier 2 and Tier 3 words and figurative language • *Richness:* Some ideas/concepts; mostly concrete; moderate information density • *Relationships:* Some connections; largely explicit • *Knowledge Demands:* Ability to handle fairly simple themes, consider a perspective somewhat different from one's own, and understand unfamiliar experiences; general background knowledge and familiarity with genre conventions required; some general and discipline-specific content knowledge	A study is underway with Coh-Metrix, a nonprofit research organization, to identify roughly five to seven computer-measurable dimensions of text cohesion. These dimensions, paired with a Lexile score, will yield a robust quantitative assessment of text complexity that, along with both the qualitative dimensions and professional judgment, will round out the Core Standards model of complexity.
Professional Judgment that weighs students' prior knowledge and life experiences as well as their interests, motivations, and maturity level.	

[17] Adapted from ACT, Inc., (2005); Carnegie Council on Advancing Adolescent Literacy (2010); Chall, Bissex, Conrad, & Harris-Sharples (1996); and Hess and Biggam (2004)

Mix of Key Text Types for Grades 4–5

Narratives	Drama	Poetry	Informational Text
At this level, includes children's adventure stories, biographies, folktales, legends, fables, fantasy, realistic fiction, and myth.	*At this level, includes staged dialogue and brief familiar scenes.*	*At this level, includes nursery rhymes, and the subgenres of narrative poems, limericks, and free verse.*	*At this level, includes books about science, history, and the arts and other nonfiction materials and digital media sources on a range of topics.*

Illustrative Texts for Narratives, Drama, and Poetry[18]	Illustrative Informational Texts
Alice in Wonderland by Lewis Carroll (1865)	*Discovering Mars* by Melvin Berger (1992)
The Little Prince by Antoine de Saint-Exupery (1943)	*Hurricanes: Earth's Mightiest Storms* by Patricia Lauber (1996)
Bud, Not Buddy by Christopher Paul Curtis (1999)	"Ancient Mound Builders" by E. Barrie Kavash from *Cobblestone* (2003)
"The Echoing Green" from *Songs of Innocence* by William Blake (1789)	*Volcanoes* by Seymour Simon (2006)
"Casey at the Bat" by Ernest Lawrence Thayer (1888)	"Kenya's Long Dry Season" by Nellie Gonzalez Cutler from *Time for Kids* (2009)
"Words Free As Confetti" by Pat Mora (1996)	"Seeing Eye to Eye" by Leslie Hall from *National Geographic Explorer* (2009)
Where the Mountain Meets the Moon by Grace Lin (2009)	

[18] See Appendix B for other texts illustrative of Grades 4–5 text complexity.

Reading and Literature Standards

Grasping specific details and key ideas

Core Standards — Students can and do:

1. Determine what the text says explicitly and make inferences required for understanding; explain how those inferences stem from the text.
2. Articulate the main ideas and themes of the text and provide a summary that captures the key supporting details.
3. Describe in detail two or more characters, events, or topics in the text and explain how they are related to one another.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. determine the theme of a story or drama, basing the understanding of theme on how characters adapt or change in response to the challenges posed in the plot
b. summarize accurately the significant events of a play or narrative in chronological order, describing where, when, why, and how specific actions take place
c. describe characters based on evidence from their thoughts, words, deeds, and interactions with others
d. describe the setting in detail, drawing on evidence of the time, place, and other cues
e. determine the theme of a poem, basing the understanding of theme on the key observations, images, or statements in a poem

Informational Text

a. outline the main and supporting ideas in the text and provide an accurate summary
b. identify the topic sentence and gist of each paragraph in a multi-paragraph text
c. describe related events in a history text or related topics in a science text and explain the relationships between the events or topics

Observing craft and structure

Core Standards — Students can and do:

4. Explain the meanings of words and phrases in the text, distinguishing literal and figurative uses.
5. Comprehend literature and information presented in a range of structures.
6. Compare and contrast texts written on the same topic or theme and explain how they are different and similar.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. describe the sensory details in texts and distinguish the use of literal versus figurative language
b. observe and explain how words with similar meanings can have different connotations
c. identify the meaning of figurative phrases and culturally significant characters found in mythology that are integral to understanding other works of literature and texts (e.g., *Herculean*, *Pandora's box*)
d. identify how narratives and plays are structured to describe the progress of characters through a series of events and challenges

e. identify rhymes and other repetitions of sounds that supply rhythm and pattern in poems and narrative prose
f. compare a narrative or a play with a presentation in another format, such as film, stage, or interactive text, and note what is surprising or different about the alternative version
g. compare works of literature on the same topic or with a similar theme

Informational Text

a. explain the meaning of key words and terms as they are used in the text
b. understand information drawn from a variety of texts with different structures, such as chronological, compare-and-contrast, or as a chain of causes and effects
c. identify and use text features (e.g., bold print, key words, topic sentences, hyperlinks, electronic menus, and icons) to locate information quickly and aid in comprehension
d. compare and contrast related accounts on the same or similar topics by different authors, by analyzing their content and perspectives

Integrating information and evaluating evidence

Core Standards — Students can and do:

7. Explain and use information presented graphically or visually in print, videos, or electronic texts.
8. Outline the information or evidence used to support an explanation or argument, determining which points support which key statements.
9. Determine the point of view or purpose that guides how events or ideas are described.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. identify the narrator of a story and explain how different stories are narrated from different perspectives
b. compare accounts of historical events and figures or natural phenomena with their depiction in a fictional work

Informational Text

a. explain how factual information presented graphically or visually (e.g., maps, charts, diagrams, timelines, animations, and other interactive visual elements) aids in the comprehension of print and electronic texts
b. explain how authors support their specific claims with evidence, including which evidence supports which claims
c. determine the author's purpose and how that is reflected in the description of the events and ideas

Developing habits for reading complex text

Core Standards — Students can and do:

10. Develop the habit of reading independently and productively, sustaining concentration and stamina to read increasingly demanding texts.

Writing and Research Standards

Writing to reflect audience, purpose, and task

Core Standards — Students can and do:

1. Write narratives, informative and explanatory texts, and arguments that demonstrate an awareness of audiences that are familiar and known to the student.

Conducting research

Core Standards — Students can and do:

2. Perform short, focused research tasks that build knowledge by exploring aspects of a single topic.
3. Gather information from experience, as well as print and digital resources.
4. Determine the accuracy and relevance of the information gathered to answer specific questions.
5. Restate information from source materials in one's own words, through summary or paraphrase.
6. Provide basic bibliographic information for print and digital sources.

Revising writing

Core Standards — Students can and do:

7. With guidance and support from peers and adults, strengthen writing through revision, editing, or beginning again to maintain a clear focus throughout.

Using tools and technology

Core Standards — Students can and do:

8. Use technology and other tools to produce, revise, and edit writing.

Developing proficiency in a range of writing

9. Create writing over extended timeframes (time for reflection and revision) and shorter timeframes (a single sitting or a day or two), responding to specific sources.

   Focus by grade level:

   Grade 4: Describing the content of literary or informational sources at the 4-5 grade band level of text complexity and content
   Grade 5: Comparing the contents of literary or informational sources at the 4-5 grade band level of complexity and content

Standards — Students can and do (by key text type):[19]

Narratives

a. orient the reader by establishing a situation, introducing characters, setting, and location, or by backfilling information after entering immediately into the storyline
b. create an organizing structure in which events are logically or causally sequenced
c. in producing a story, create a plot with an initiating event, complicating action, a climax, and a resolution
d. use a variety of temporal words, phrases, and clauses to signal sequence
e. use concrete and sensory details to develop narrative elements
f. develop the narrative using techniques such as dialogue, pacing, and reporting the narrator's thoughts
g. show both external behaviors and the internal responses of characters to events
h. provide closure and a realistic outcome of the narrative's events

Informative and Explanatory Texts

a. state the topic clearly and provide a general observation and focus
b. develop the subject using relevant facts, concrete details, quotations, or other information and examples
c. group related information logically in basic structures (paragraphs, sections) and provide headings or illustrations when useful
d. employ specialized vocabulary and a formal, objective style when appropriate
e. use appropriate links to join ideas
f. include only relevant appropriate information to demonstrate focus
g. provide a conclusion related to the information or explanation offered

Arguments (opinions)

a. introduce an opinion about a concrete issue or topic
b. support opinions with relevant reasons
c. support reasons with specific details
d. link the reasons together using words, phrases, and clauses (e.g., *because*, *since*)
e. adopt a relatively formal style for sharing and defending an opinion when appropriate to the discipline or context
f. provide a concluding statement or section that offers reflections, restatement, or recommendations consistent with the opinion presented

Speaking and Listening Standards

Listening closely and participating productively

Core Standards — Students can and do:

1. Participate productively one on one, in small groups, and as a whole class, joining in discussions and making relevant points about what they have read, heard, or written.
2. Sustain concentration on information presented orally, visually, or multi-modally and confirm understanding by summarizing the main ideas and supporting details.

Standards — Students can and do (by key communication type):

[19] See Appendix C for samples of student writing that illustrate through annotations the level of quality required to meet the writing standards.

Classroom discussions and collaboration

a. come to discussions having read required material and, in conversation, build upon background knowledge from that material and other information known about the topic
b. demonstrate understanding of the content and ideas presented or discussed by distilling them into an accurate summary
c. ask questions to clarify or follow up on ideas or information presented orally or through other media
d. respond to questions and make comments that contribute to the topic and ideas of previous speakers
e. explain information presented graphically or visually in conjunction with other information presented orally
f. engage productively and respectfully with others during discussions, including listening actively, gaining the floor respectfully, and qualifying or justifying what they think after listening to others' questions or accounts

Exchanging information and speaking effectively

Core Standards — Students can and do:

3. Share experiences, opinions or other information, choosing material that is relevant to the topic and to the listeners.
4. Speak audibly and clearly at an appropriate and understandable pace, using formal English when indicated or appropriate (e.g., presenting ideas versus class discussion).

Standards — Students can and do (by key communication type):

Presentation of ideas and information

a. speak coherently about events, topics, or texts that focus and organize ideas in a logical sequence and include facts, details, or other information that support the main ideas
b. use appropriate volume, phrasing, and pace for clarity
c. read aloud prose and poetry, with appropriate emotion and fidelity to the text

Language Development Standards

Conventions

In grades 4–5, students heighten their ability to situate and describe using language that is increasingly precise and vivid. They form and use verbs of various tenses to locate people, actions, and events in time, and they correctly use adjectives and adverbs to modify. Students begin to gain control of frequently confused words (e.g., *effect, affect*) and edit writing to remove language that is not idiomatic. Their mastery of capitalization is complete. They use punctuation to separate items in a series and a comma to distinguish an introductory element from the main part of the sentence. Students mark titles in conventional ways. They understand how to quote and use quotation marks. Their spelling is conventional. Their language is increasingly topic specific, precise, and varied, and they manipulate sentence structure for effect.

Key Terms: adjective; adverb; interjection; preposition; simple, progressive, and perfect tense

Conventions of language and writing

Core Standards — Students can and do:

1. Maintain the focus of a paragraph on a topic through structural elements such as main ideas, supporting sentences, and transitions.

Grammar and usage

Core Standards — Students can and do:

2. Form and use the simple (e.g., *I walked, I walk, I will walk*), progressive (e.g., *I was walking, I am walking, I will be walking*) and the perfect (e.g., *I had walked, I have walked, I will have walked*) verb tenses.
3. Recognize and correct inappropriate shifts in verb tense.*
4. Form and choose between adjectives and adverbs (including comparative and superlative forms), placing them appropriately within the sentence.*
5. Correctly use frequently confused words.*
6. Use idiomatic language.*

Mechanics

Core Standards — Students can and do:

7. Capitalize the first word in quotations as appropriate and other important words, such as section headers.
8. Use punctuation to separate items in a series.*
9. Use a comma to separate an introductory element from the rest of the sentence.
10. Use underlining, quotation marks, or italics to indicate titles of works.
11. Use quotation marks to mark direct speech and quotations from a text.
12. Spell grade-appropriate words correctly, consulting references as needed.*

Word choice and style

Core Standards — Students can and do:

13. Use specialized, topic-specific language to convey ideas precisely.*
14. Use figurative language to create images or make comparisons and connections between people, objects, or ideas.*
15. Use punctuation for effect.*
16. Expand, combine, and reduce sentences for meaning, reader/listener interest, and style.*[20]

Focus by Grade-Level
Grade 4: Distinguish one idea or thing from another (Conventions Standards #'s1-3, #8, #9, #11)
Grade 5: Word choice (Conventions Standards #'s 4-6, #13, #14)

[20] Conventions standards noted with an asterisk (*) need to be revisited by students in subsequent grades. See Appendix A for a complete listing.

Vocabulary

Key to students' vocabulary development is building rich and flexible word knowledge marked by multiple connections that link a word to similar words and to contexts and experiences that are related to that word—as compared to simply a definition. In grades 4–5, students are capable of selecting among a wide range of strategies—analyzing the word itself, using localized context clues (particularly at the sentence level), and consulting reference materials—to determine and clarify the meaning of unknown and multiple-meaning words. They develop the habit of verifying their inferences of word meanings. They are able to interpret simple figurative language found in what they read. They learn and can paraphrase many common idioms, proverbs, and adages. They make distinctions among words based on connotation. They acquire new words through interactive language use, including informal talk, discussion, reading and responding to text as well as by being taught the words directly. This includes a focus on "Tier 2" words and phrases (those that commonly appear in writing but not in spoken language), "Tier 3" words and phrases (those that are specific and important to particular disciplines).[21]

Determining the meaning of words

Core Standards — Students can and do:

1. Determine or clarify the meaning of an unknown word by using one or more of the following strategies:
   - analyzing the word's sounds, spelling, and meaningful word parts
   - using semantic clues in sentences, such as definitions, examples, or restatements included within the text
   - using syntactic clues, such as using its position within the sentence as a guide to whether it represents a thing or an action
   - consulting reference materials, including glossaries, dictionaries, and thesauruses, both print and digital
2. Determine the relevant meaning of multiple-meaning words by using context.
3. Verify the preliminary determination of a word's meaning (e.g., by checking the inferred meaning in context or by looking up the word in a dictionary).
4. Interpret figurative language, including simple similes and metaphors.
5. Paraphrase the meaning of common idioms, adages, and proverbs.

Understanding the nuances of words (denotations and connotations)

Core Standards — Students can and do:

6. Distinguish a word from other words with similar but not identical meanings (synonyms).

Acquiring vocabulary

Core Standards — Students can and do:

7. Acquire and use a grade-appropriate vocabulary of Tier 2[22] words taught directly and gained through reading.
8. Acquire and use a grade-appropriate vocabulary of Tier 3 words taught directly and gained through reading.
9. Know and use words and phrases that signal contrast, addition, or other logical relationships (e.g., *however*, *although*, *nevertheless*, *similarly*, *moreover*, *in addition*).

[21] Beck I. L., McKeown, M.G. & Kucan, L. (2002). *Bringing Words to Life; Robust Vocabulary Instruction*, New York; Guilford Press

Grade 4 English Language Arts: Focus for Instruction

Reading and Literature

In grade 4, students apply the reading standards to the following types of text: narratives, drama, poetry, and informational text. Students focus on learning to read text at the 4-5 grade band level independently, with scaffolding likely required for texts at the high end of the range.

- Reading standards applied to different text types
- Mix of text types: Narratives, Drama, Poetry, Informational Text
- **Text Complexity focus:** 100% text at the 4-5 grade band level

100%

Writing and Research

In grade 4, students apply the standards in writing to the following types of text: Narrative, Informative/Explanatory, and Argument. Students perform research, including short focused research tasks. They also write over various time frames in response to specific sources.

- Writing standards applied to different text types: Narrative, Informative/Explanatory, Argument
- Research, including short focused research tasks
- **Grade-specific focus:** Students create writing over extended and shorter timeframes, responding to specific sources by describing the contents of literary or informational sources at the 4-5 grade band level of complexity and content

Speaking and Listening

In grade 4, students apply the core speaking and listening standards in different contexts.

- Speaking and listening standards applied in different contexts: classroom discussion and collaboration as well as in presentation of ideas and information

Language Development

In grade 4, students apply the language development standards by applying the core vocabulary standards to determine word meaning, understand word nuances, and acquire vocabulary and to produce writing and speaking that observes appropriate conventions.

- Vocabulary standards applied to reading, writing, speaking and listening
- **Grade-specific conventions focus:** Distinguish one idea or thing from another:
  - Maintain the focus of a paragraph on a topic… (Conventions Standard #1)
  - Form and use the simple, progressive and perfect verb tenses … (Conventions Standard #2)
  - Recognize and correct inappropriate shifts in verb tense. (Conventions Standard #3)
  - Use punctuation to separate items in a series … (Conventions Standard #8)
  - Use a comma to separate an introductory element … (Conventions Standard #9)
  - Use quotation marks to mark direct speech and quotations … (Conventions Standard #11)

Grade 5 English Language Arts: Focus for Instruction

Reading and Literature

In grade 5, students apply the reading standards to the following types of text: narratives, drama, poetry, and informational text. Students focus on learning to read text at the 4-5 grade band level independently and are introduced to 6-8 grade band "stretch" texts, which will likely require scaffolding.

- Reading standards applied to different text types
- Mix of text types: Narratives, Drama, Poetry, Informational Text
- **Text Complexity focus:** 70% text at the 4-5 grade band level, 30% text at the 6-8 grade band level

70% | 30%

Writing and Research

In grade 5, students apply the standards in writing to the following types of text: Narrative, Informative/Explanatory, and Argument. Students perform research, including short focused research tasks. There also write over various time frames in response to specific sources.

- Writing standards applied to different text types: Narrative, Informative/Explanatory, Argument
- Research, including short focused research tasks
- **Grade-specific focus:** Students create writing over extended and shorter timeframes, responding to specific sources by comparing the contents of literary or informational sources at the 4-5 grade band level of complexity and content.

Speaking and Listening

In grade 5, students apply the speaking and listening standards in different contexts.

- Speaking and listening Standards applied in different contexts: classroom discussion and collaboration as well as in presentation of ideas and information.

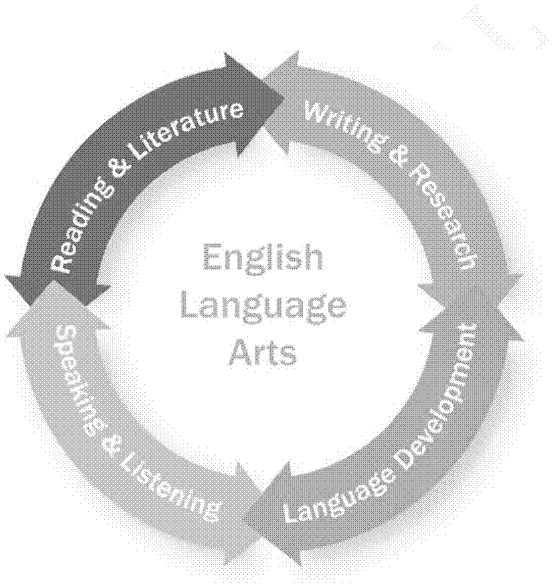
Language Development

In grade 5, students apply the language development standards by applying the core vocabulary standards to determine word meaning, understand word nuances, and acquire vocabulary and to produce writing and speaking that observes appropriate conventions.

- Vocabulary standards applied to both reading, writing, speaking and listening
- **Grade-specific conventions focus:** Word choice
  - Form and choose between adjectives and adverbs. (Conventions Standard #4)
  - Correctly use frequently confused words. (Conventions Standard #5)
  - Use idiomatic language. (Conventions Standard #6)
  - Use specialized, topic specific language to convey ideas precisely. (Conventions Standard #13)
  - Use figurative language to create images … (Conventions Standard #14)

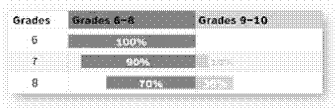
English Language Arts

Grades 6–8



Required Text Complexity by Grade

Proportion of Texts Within and Above Grade Band to be Read in Each Grade



While advancing through grades 6–8, students must engage with texts of steadily increasing complexity.

- **In grade 6**, students focus on reading texts in the 6–8 grade band level with scaffolding likely required for texts at the high end of the range.
- **In grade 7**, students focus on reading texts in the 6–8 grade band level (90 percent) independently and are introduced to texts in the 9–10 grade band level as "stretch" texts (10 percent), which will likely require scaffolding.
- **In grade 8**, students focus on reading texts in the 6–8 grade band level (70 percent) independently as well as sustained practice with texts in the 9–10 grade band level as "stretch" texts (30 percent), which will likely require scaffolding.

Determining Text Complexity for Grades 6–8[23]

Text complexity is determined by a mix of qualitative and quantitative measures of the text itself refined by teachers' professional judgment about the match of particular texts to particular students. The qualitative dimensions of text complexity are best understood as continua of increasing complexity rather than as representing discrete and easily defined stages. Most authentic texts will exhibit some but not all of the traits linked to a particular grade band; qualitatively assigning a text to a grade band is therefore a matter of "best fit," or determining which grade band's set of descriptors most accurately describes the text.

Qualitative Measures of Texts	Quantitative Measures of Texts
• *Structure:* Largely implicit and subtle; graphic representations are essential to meaning; texts are of increasing length • *Purpose:* Single or multiple; subtly stated • *Style and Language:* Moderately demanding; several literary devices; consistent use of Tier 2 and 3 words and figurative language • *Richness:* Several ideas/concepts; mostly abstract; moderate information density • *Relationships:* Several connections; largely implicit • *Knowledge Demands:* Ability to handle fairly challenging themes, consider multiple perspectives, and understand unfamiliar experiences; cultural and historical knowledge useful for understanding characters, settings, and allusions; some discipline-specific content knowledge	A study is underway with Coh-Metrix, a nonprofit research organization, to identify roughly five to seven computer-measurable dimensions of text cohesion. These dimensions, paired with a Lexile score, will yield a robust quantitative assessment of text complexity that, along with both the qualitative dimensions and professional judgment, will round out the Core Standards model of complexity.
Professional Judgment that weighs students' prior knowledge and life experiences as well as their interests, motivations, and maturity level.	

[23] Adapted from ACT, Inc., (2005); Carnegie Council on Advancing Adolescent Literacy (2010); Chall, Bissex, Conrad, & Harris-Sharples (1996); and Hess and Biggam (2004)

Mix of Key Text Types for Grades 6–8

Narratives	Drama	Poetry	Informational Text
At this level, includes the subgenres of adventure stories, biographies, memoirs, historical fiction, mysteries, folktales, legends, fables, tall tales, myths, fantasy, science fiction, realistic fiction, and graphic novels.	*At this level, includes one-act and multi-act plays both as text and film.*	*At this level, includes the subgenres of narrative poems, lyrical poems, free verse, odes, ballads, and epics.*	*At this level, includes such subgenres as exposition and argument in the form of essays, opinion pieces, speeches, opinion pieces as well as other documents and digital media sources on a range of topics.*

Illustrative Texts for Narratives, Drama, and Poetry[24]	Illustrative Informational Texts
Little Women by Louisa May Alcott (1869)	*Preamble and First Amendment to the United States Constitution* by United States (1787, 1791) **
The Adventures of Tom Sawyer by Mark Twain (1876)	*Narrative of the Life of Frederick Douglass an American Slave* by Frederick Douglass (1845)
A Wrinkle in Time by Madeline L'Engle (1962)	"Gettysburg Address"** by Abraham Lincoln (1863)
The Dark Is Rising by Susan Cooper (1973)	"Blood, Toil, Tears and Sweat" by Winston Churchill (1940)
Black Ships before Troy: The Story of the Iliad by Rosemary Sutcliff (1993)	*Travels with Charley: In Search of America* by John Steinbeck (1962)
A Midsummer Night's Dream by William Shakespeare (1596)	*I Know Why the Caged Bird Sings* by Maya Angelou (1969)
"Oh Captain, My Captain" by Walt Whitman (1865)	
"Stopping by a Wood on a Snowy Evening" by Robert Frost (1923)	
"I, Too" by Langston Hughes (1925)	

Seminal historical texts that all students are expected to read

[24] See Appendix B for other texts illustrative of Grades 6-8 text complexity.

Reading and Literature Standards

Grasping specific details and key ideas

Core Standards — Students can and do:

1. Read the text closely to determine what the text says explicitly and to make logical inferences from it; cite text evidence to support understanding in discussion and in writing.
2. Articulate the text's main ideas and themes and provide a summary that captures the key supporting details, without taking a position or expressing an opinion.
3. Explain in detail how events, ideas, and characters unfold in the text and interact with one another.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. infer themes when they are not explicitly stated and provide evidence on which those inferences are based
b. analyze the development of the narrative, describing how particular incidents advance or foreshadow the plot
c. recognize how the setting unfolds over the course of the text and describe its significance to the work
d. build on an author's explicit descriptions and other evidence to draw reasonable conclusions about characters and how they interact, change, and influence the central events
e. describe how a play unfolds and how particular lines of dialogue propel the action, reveal aspects of a character, or provoke a decision
f. analyze how patterns of imagery in a poem contribute to its overall theme or meaning

Informational Text

a. summarize a text without expressing a personal opinion by drawing on the author's specific description of events or information
b. determine how key ideas or concepts build on one another to reveal an overarching theme or idea

Observing craft and structure

Core Standards — Students can and do:

4. Interpret the meanings of words and phrases, including connotative and figurative meanings, and explain how specific word choices shape the meaning of the text.
5. Explain the text's structure, including how specific sentences, paragraphs, and larger portions build on each other and contribute to the whole of the text.
6. Compare and contrast how two or more texts written on similar topics or themes differ in their focus and key details.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. analyze how the author's choice of specific words or details contributes to the understanding of events and characters or to the tone of a narrative
b. trace the specific comparisons made by similes, metaphors, and analogies and explain how they contribute to the meaning of the text
c. compare similar ideas and themes as well as character types in myths, folktales, and legends from different cultures
d. analyze the impact of line breaks and stanzas on the meaning of a poem and acts, scenes, and stage directions on the meaning of a drama
e. compare the events, characters, ideas, and themes in texts written by the same author or on similar topics or themes

Informational Text

a. interpret the connotative meaning of closely related words and phrases as they are used in the text (e.g., *angry* versus *irate*)
b. describe how an author organizes the explanation or argument, as well as the ways in which the text's structure, language, and examples support its purpose
c. examine the structure of a Web site or other electronic text and describe how it organizes information and links to additional sources

Integrating information and evaluating evidence

Core Standards — Students can and do:

7. Interpret information presented graphically or visually in print, videos, or electronic texts and explain how this information clarifies and contributes to the text.
8. Analyze the structure and content of an argument, including its main claims or conclusions, supporting premises, and evidence.
9. Determine the point of view or purpose represented in the text, assessing how it shapes the content.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. compare the points of view from which different novels and poems are told, as well as the viewpoints of different characters in a drama
b. compare the fictional portrayal of a time, place, or character to historical sources from the period to determine which historical details have been emphasized, deleted, or changed in the fictional portrayal

Informational Text

a. interpret factual and quantitative data presented in diverse formats (including maps, charts, and diagrams as well as electronic media) and explain how this information clarifies or contributes to the text
b. distinguish between fact, opinion, and reasoned judgment presented in essays, speeches, and critiques
c. evaluate the strength of an argument's premises and specific claims as well as the degree to which each is supported by evidence
d. compare and contrast the viewpoints and use of evidence of two different authors writing about the same topic

Developing habits for reading complex text

Core Standards — Students can and do:

10. Develop the habit of reading independently and productively, sustaining concentration and stamina to read increasingly demanding texts.

Writing and Research Standards

Writing to reflect audience, purpose, and task

Core Standards — Students can and do:

1. Write narratives, informative and explanatory texts, and arguments that match purpose to task and address familiar as well as somewhat distant audiences (e.g., mayor, readers of school or neighborhood newspaper).

Conducting research

Core Standards — Students can and do:

2. Perform short, focused research projects that demonstrate understanding of the material under investigation and generate additional related questions for research.
3. Gather information independently using a variety of relevant print and digital resources.
4. Assess the credibility, reliability, consistency, and accuracy of the information and sources gathered.
5. Represent and cite accurately the data, conclusions, and opinions of others, quoting and paraphrasing them into one's own work while avoiding plagiarism.
6. Provide full bibliographic information for print and digital sources in a standard format and document quotations, paraphrases, and other information.

Revising writing

Core Standards — Students can and do:

7. With some guidance and support from peers and adults, strengthen writing through revising, editing, or beginning again to ensure logical organization, precision of word choice, and coherence.

Using tools and technology

Core Standards — Students can and do:

8. Use technology and other tools to produce, revise, and distribute writing, as well as interact online with others about writing, including responding to and providing feedback

Developing proficiency in a range of writing

9. Create writing over extended timeframes (time for reflection and revision) and shorter timeframes (a single sitting or a day or two), responding to specific sources.

   Focus by grade level:

   Grade 6: Conveying the main ideas and key details of literary or informational sources at the 6-8 grade band level of text complexity and content
   Grade 7: Analyzing the contents of literary or informational sources at the 6-8 grade band level of complexity and content
   Grade 8: Comparing or evaluating the contents of literary or informational sources at the 6-8 grade band level of complexity and content

Standards — Students can and do (by key text type):[25]

Narratives

a. orient the reader by establishing a situation, introducing characters, setting, and location, or by backfilling information after entering immediately into the storyline
b. create an organizing structure in which events are logically or causally sequenced
c. in producing a story, create a plot with well-structured episodes (e.g., initiating event, complicating action, resolution)
d. use a variety of temporal words, phrases, and clauses to convey sequence, to shift from one time frame to another, and to show the relationships among events
e. use relevant, specific details and literary devices, such as imagery and metaphor, purposefully to develop setting, plot, and character
f. use techniques such as pacing, dialogue, or foreshadowing to highlight the significance of events or create particular effects (e.g., tension or suspense)
g. show internal mental processes to develop complex characters and convey their needs, motives, and emotional responses
h. provide an engaging conclusion, such as a surprise ending, a reflection, or a conclusion that returns to the beginning

Informative and Explanatory Texts

a. establish the topic in an introduction that provides a sense of what's to follow
b. develop the subject through relevant and specific facts, concrete details, quotations, or other information and examples
c. organize specific information under broader concepts or categories and provide headings, figures, tables, or diagrams when useful
d. use factual, precise language and maintain a formal, objective style when appropriate
e. use strategies appropriate to informational and explanatory texts such as defining, classifying, comparing/contrasting, and cause/effect
f. use appropriate links to join ideas and create cohesion
g. provide only accurate and relevant information
h. provide a conclusion that follows logically from the information or explanation presented

Arguments

a. introduce a claim about a topic or concept
b. support claims with logical reasons
c. support reasons with detailed and relevant evidence

[25] See Appendix C for samples of student writing that illustrate through annotations the level of quality required to meet the writing standards.

d. signal the relationship between reasons, or between reasons and evidence, using words, phrases, and clauses (*e.g., another reason, such as, therefore, in addition*)
e. sustain an objective style and tone appropriate for making a case when appropriate to the discipline or context
f. include only relevant information and evidence in support of claims
g. provide a concluding statement or section that offers reflections, a restatement, or recommendations that follow from the argument

Speaking and Listening Standards

Listening closely and participating productively

Core Standards — Students can and do:

1. Participate productively one on one, in small groups, and as a whole class, joining in discussions and remaining flexible and adaptable as participants.
2. Sustain concentration on information presented orally, visually, or multi-modally and confirm understanding by drawing well-supported inferences about the purpose and meaning of the information.

Standards — Students can and do (by key communication type):

Classroom discussions and collaboration

a. come to discussions having completed reading or other preparation in advance and draw on that material explicitly in discussions
b. determine a speaker's attitude or point of view toward a topic presented orally or through other media
c. ask questions to check understanding to clarify the main ideas and the supporting evidence of material presented orally or through other media
d. advance a discussion by answering questions precisely and sharing specific factual knowledge and observations supported by credible evidence
e. interpret information presented in visual and digital formats and explain how this data clarifies and contributes to a discussion or information presented orally
f. support productive teamwork by setting clear goals and deadlines, monitoring progress and participation of each team member, and taking different views into account and modifying own views when indicated in light of what others say

Exchanging information and speaking effectively

Core Standards — Students can and do:

3. Share experiences, opinions, and other information, gaining and maintaining the interest and response of listeners.
4. Use appropriate tone and phrasing for emphasis, demonstrating a growing command of formal English when indicated or appropriate (e.g., presenting ideas versus class discussion).

Standards — Students can and do (by key communication type):

Presentation of ideas and information

a. organize and present information about situations, topics, or texts that emphasize salient points and clarify and support claims and findings with pertinent and specific descriptions, facts, and examples in ways that are accessible and verifiable to listeners
b. use gesture, tone, phrasing, and pace for emphasis
c. incorporate visual displays and electronic media when helpful and in a manner that strengthens the presentation
d. perform dramatic readings of various prose and poetry speaking with clarity, fidelity, and responsiveness to the text, noting changes in the situation, mood, or tone of text

Language Development Standards

Conventions

In grades 6–8, students develop a firm command of sentence structure. They are able to form sentences of varying structures, place phrases and clauses properly within a sentence, and use a variety of coordinating and subordinating conjunctions to express relationships between sentence parts. Students have also mastered pronoun use, ensuring proper case, number, and person and avoiding vagueness. They understand and use verb voice and mood, and identify and correct inappropriate shifts in pronouns and verbs. Students set off nonrestrictive or parenthetical elements from the rest of the sentence with proper punctuation and use a comma before a coordinating conjunction in a compound sentence. They vary sentence patterns for effect and edit writing for redundancy and wordiness.

Key Terms: conjunction; dash; nonrestrictive/parenthetical element; indicative, imperative, interrogative, conditional, and subjunctive mood; parentheses; phrase and clause; pronoun case, number, and person; simple, compound, complex, and compound-complex sentence; active and passive voice

Grammar and usage

Core Standards — Students can and do:

1. Form compound, complex, and compound-complex sentences.
2. Place phrases and clauses within a sentence, avoiding misplaced and dangling modifiers.*
3. Ensure that pronouns are in the proper case (subjective, objective, possessive).
4. Recognize and correct inappropriate shifts in pronoun number and person.*
5. Recognize and correct vague pronouns with unclear or ambiguous antecedents.*
6. Form and use verbs in the active and passive voice.
7. Form and use verbs in the indicative, imperative, interrogative, conditional, and subjunctive mood.
8. Avoid inappropriate shifts in verb voice and mood.*

Mechanics

Core Standards — Students can and do:

9. Use punctuation to set off nonrestrictive/parenthetical elements with commas, parentheses, or dashes.*
10. Use a comma before a coordinating conjunction in a compound sentence.

Word choice and style

Core Standards — Students can and do:

11. Use verbs in the active and passive voice and in the conditional and subjunctive moods to achieve particular effects (e.g., emphasizing the actor or the action; expressing uncertainty or describing a state contrary to fact).
12. Vary sentence patterns for meaning, reader/listener interest, and style.*
13. Choose words and phrases to express ideas precisely and concisely, avoiding wordiness and redundancy.*[26]

Grade-Level Focus
Focus by Grade-Level
Grade 6: Pronouns (Conventions Standards #s 3-5)
Grade 7: Sentence structure (Conventions Standards #1, #2, #12)
Grade 8: Verb voice and mood (Conventions Standards #s 6-8, #11)

Vocabulary

Key to students' vocabulary development is building rich and flexible word knowledge marked by multiple connections that link a word to similar words and to contexts and experiences that are related to that word—as compared to simply a definition. In grades 6–8, students continue to make use of a range of strategies to determine and clarify the meaning of unknown and multiple-meaning words. This repertoire now includes considering the word's use in a broader context that includes the content of the paragraph in which the word appears and the overarching structure of the text. They habitually verify their inferences of word meanings. They interpret a variety of figurative language found in what they read. They make distinctions among words based on connotation. They acquire new words through interactive language use, including informal talk, discussion, reading and responding to text as well as by being taught the words directly. This includes a continuing focus on "Tier 2" words and phrases (those that commonly appear in writing but not in spoken language), "Tier 3" words and phrases (those that are specific and important to particular disciplines).

Determining the meaning of words

Core Standards — Students can and do:

1. Determine or clarify the meaning of an unknown word by using one or more of the following strategies:
   - using knowledge of roots, prefixes, and suffixes
   - using semantic clues, such as sentence and paragraph context as well as the organizational structure of the text (e.g., cause and effect, comparison and contrast)
   - using syntactic clues, such as using its position within the sentence as a guide to whether it is a subject, verb, or object
   - consulting reference materials, including glossaries, dictionaries, and thesauruses, both print and digital
2. Determine the relevant meaning of multiple-meaning words by using context.
3. Verify the preliminary determination of a word's meaning (e.g., by checking the inferred meaning in context or by looking up the word in a dictionary).
4. Interpret figurative language, including metaphors, similes, and idioms.

[26] Conventions standards noted with an asterisk (*) need to be revisited by students in subsequent grades. See Appendix A for a complete listing.

Understanding the nuances of words (denotations and connotations)

Core Standards — Students can and do:

5. Distinguish a word from other words with similar but not identical meanings (synonyms).

Acquiring vocabulary

Core Standards — Students can and do:

6. Acquire and use a grade-appropriate vocabulary of Tier 2 words taught directly and gained through reading.
7. Acquire and use a grade-appropriate vocabulary of Tier 3 words taught directly and gained through reading.

CONFIDENTIAL

Grade 6 English Language Arts: Focus for Instruction

Reading and Literature

In grade 6, students apply the reading standards to the following types of text: narratives, drama, poetry, and informational text. Students focus on learning to read text at the 6-8 grade band level independently, with scaffolding likely required for texts at the high end of the range.

- Reading standards applied to different text types
- Mix of text types: Narratives, Drama, Poetry, Informational Text
- **Text Complexity focus:** 100% text at the 6-8 grade band level

Writing and Research

In grade 6, students apply the writing standards to the following types of text: Narrative, Informative/Explanatory, and Argument. Students perform research, including short focused research tasks. They also write over various time frames in response to specific sources.

- Writing standards applied to different text types: Narrative, Informative/Explanatory, Argument
- Research, including short focused research tasks
- **Grade-specific focus:** Students create writing over extended and shorter time frames, responding to specific sources by conveying the main ideas and key details of literary or informational sources at the 6-8 grade band level of complexity and content.

Speaking and Listening

In grade 6, students apply the core speaking and listening standards in different contexts.

- Speaking and listening Standards applied in different contexts: classroom discussion and collaboration as well as in presentations of ideas and information.

Language Development

In grade 6, students apply the language development standards by applying the core vocabulary standards to determine word meaning, understand word nuances, and acquire vocabulary and to produce writing and speaking that observes appropriate conventions

- Vocabulary standards applied to both reading, writing, speaking and listening
- **Grade-specific conventions focus:** Pronouns
  - Ensure that pronouns are in the proper case… (Conventions Standard #3)
  - Recognize and correct inappropriate shifts… (Conventions Standard #4)
  - Recognize and correct vague pronouns… (Conventions Standard #5)

Grade 7 English Language Arts: Focus for Instruction

Reading and Literature

In grade 7, students apply the reading standards to the following types of text: narratives, drama, poetry, and informational text. Students focus on learning to read text at the 6-8 grade band level independently and are introduced to 9-10 grade band level "stretch" texts, which will likely require scaffolding.

- Reading Standards applied to different text types
- Mix of text types: Narratives, Drama, Poetry, Informational Text
- **Text Complexity focus:** 90% at the 6-8 grade band level, 10% at the 9-10 grade band level

Writing and Research

In grade 7, students apply the standards in writing to the following types of text: Narrative, Informative/Explanatory, and Argument. Students perform research, including short focused research tasks. They also write over various time frames in response to specific sources.

- Writing standards applied to different text types: Narrative, Informative/Explanatory, Argument
- Research, including short focused research tasks
- **Grade-specific focus:** Students create writing over extended and shorter timeframes, responding to specific sources by analyzing the contents of literary or informational sources at the 6-8th grade band level of complexity and content.

Speaking and Listening

In grade 7, students apply the core speaking and listening standards in different contexts.

- Speaking and listening standards applied in different contexts: classroom discussion and collaboration as well as in presentations of ideas and information.

Language Development

In grade 7, students apply the language development standards by applying the core vocabulary standards to determine word meaning, understand word nuances, and acquire vocabulary and to produce writing and speaking that observes appropriate conventions.

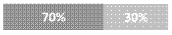
- Vocabulary standards applied to reading, writing, speaking and listening
- **Grade-specific conventions focus:** Sentence structure
  - Form compound, complex… (Conventions Standard #1)
  - Place phrases and clauses… (Conventions Standard #2)
  - Vary sentence patterns… (Conventions Standard #12)

Grade 8 English Language Arts: Focus for Instruction

Reading and Literature

In grade 8, students apply the reading standards to the following types of text: narratives, drama, poetry, and informational text. Students focus on reading text at the 6-8 grade band level independently as well as on sustained practice with 9-10 grade band level "stretch" texts, which may require scaffolding.

- Reading standards applied to different text types
- Mix of text types: Narratives, Drama, Poetry, Informational Text



- **Text Complexity focus:** 70% at the 6-8 grade band level, 30% at the 9-10 grade band level

Writing and Research

In grade 8, students apply the standards in writing to the following types of text: Narrative, Informative/Explanatory, and Argument. Students perform research, including short focused research tasks. They also write over various time frames in response to specific sources.

- Writing standards applied to different text types: Narrative, Informative/Explanatory, Argument
- Research, including short focused research tasks
- **Grade-specific focus:** Students create writing over extended and shorter timeframes, responding to specific sources by analyzing the contents of literary or informational sources at the 6-8th grade band level of complexity and content.

Speaking and Listening

In grade 8, students apply the core speaking and listening standards in different contexts.

- Speaking and listening standards applied in different contexts: classroom discussion and collaboration as well as in presentations of ideas and information.

Language Development

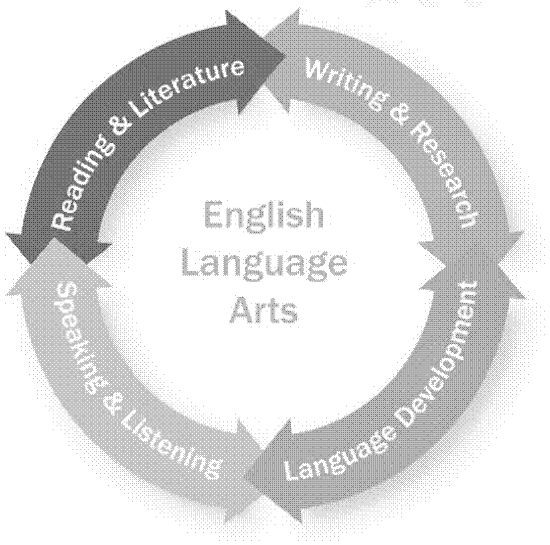
In grade 8, students apply the language development standards by applying the core vocabulary standards to determine word meaning, understand word nuances, and acquire vocabulary and to produce writing and speaking that observes appropriate conventions.

- Vocabulary standards applied to reading, writing, speaking and listening
- **Grade-specific conventions focus:** Verb voice and mood
  - Form and use verbs in the active and passive voice (Conventions Standard #6)
  - Form and use verbs in the indicative… (Conventions Standard #7)
  - Avoid inappropriate shifts… (Conventions Standard #8)
  - Use verbs in the …voice …mood… (Conventions standard #11)

English Language Arts

Grades 9–10

FINAL



Required Text Complexity by Grade

Proportion of Texts Within and Above Grade Band to be Read in Each Grade

While advancing through grades 9–10, students must engage with texts of steadily increasing complexity.

- **In grade 9**, students focus on reading texts in the 9–10 grade band level with scaffolding likely required for texts at the high end of the range.
- **In grade 10**, students focus on reading texts in the 9–10 grade band level (70 percent) independently and are introduced to texts in the 11–CCR grade band level as "stretch" texts (30 percent), which will likely require scaffolding.

Determining Text Complexity for Grades 9–10[27]

Text complexity is determined by a mix of qualitative and quantitative measures of the text itself refined by teachers' professional judgment about the match of particular texts to particular students. The qualitative dimensions of text complexity are best understood as continua of increasing complexity rather than as representing discrete and easily defined stages. Most authentic texts will exhibit some but not all of the traits linked to a particular grade band; qualitatively assigning a text to a grade band is therefore a matter of "best fit," or determining which grade band's set of descriptors most accurately describes the text.

Qualitative Measures of Texts	Quantitative Measures of Texts
• *Structure:* Implicit, subtle, graphic representations are essential to meaning, texts of increasing length • *Purpose:* Multiple, often implicit • *Style and Language:* Demanding, many literary devices, extensive use of Tier 2 and 3 words and figurative language • *Richness:* Several ideas/concepts; abstract • *Relationships:* Several connections; implicit • *Knowledge Demands:* Ability to handle challenging themes, consider multiple perspectives, and understand experiences distinctly different from one's own; cultural and historical knowledge useful for understanding characters, settings, and allusions; extensive discipline-specific content knowledge	A study is underway with Coh-Metrix, a nonprofit research organization, to identify roughly five to seven computer-measurable dimensions of text cohesion. These dimensions, paired with a Lexile score, will yield a robust quantitative assessment of text complexity that, along with both the qualitative dimensions and professional judgment, will round out the Core Standards model of complexity.
Professional Judgment that weighs students' prior knowledge and life experiences as well as their interests, motivations, and maturity level.	

[27] Adapted from ACT, Inc., (2005); Carnegie Council on Advancing Adolescent Literacy (2010); Chall, Bissex, Conrad, & Harris-Sharples (1996); and Hess and Biggam (2004)

Mix of Key Text Types for 9–10

Narratives	Drama	Poetry	Informational Text
At this level, includes the subgenres of adventure stories, biographies, memoirs, historical fiction, mysteries, science fiction, mysteries, myths, science fiction, realistic fiction, allegories, parodies, satire, and graphic novels.	*At this level, includes one-act and multi-act plays both in written form and on film.*	*At this level, includes the subgenres of narrative poems, lyrical poems, free verse, odes, ballads, and epics.*	*At this level, Includes such subgenres as exposition and argument in the form of essays, speeches, opinion pieces as well as other documents and digital media sources on a range of topics.*

Illustrative Texts for Narratives, Drama, and Poetry[28]

The Odyssey by Homer (8th century B.C.E.) translated by Robert Fagles

The Grapes of Wrath by John Steinbeck (1939)

The Killer Angels by Michael Shaara (1975)

In the Time of the Butterflies by Julia Alvarez (1994)

The Glass Menagerie by Tennessee Williams (1944)

"Song" by John Donne (1635)

"The Raven" by Edgar Allen Poe (1845)

"Loveliest of Trees" by A.E. Houseman (1896)

"I Am Offering This Poem to You" by Jimmy Santiago Baca (1977)

Illustrative Informational Texts

"Second Inaugural Address" by Abraham Lincoln (1865)**

"State of the Union Address" by Franklin Delano Roosevelt (1941)

"Remarks to the Senate in Support of a Declaration of Conscience" by Margaret Chase Smith (1950)

"Address at the March on Washington" by Martin Luther King, Jr. (1963)**

"A Quilt of a Country" by Anna Quindlen (2001)

Seminal historical texts that all students are expected to read

[28] See Appendix B for other texts illustrative of Grades 9–10 text complexity.

Reading and Literature Standards

Grasping specific details and key ideas

Core Standards — Students can and do:

1. Read the text closely to determine what the text says explicitly and to make logical inferences from it; cite text evidence to support analyses in discussion and in writing.
2. Articulate the theses and themes and summarize how they develop over the course of the text and how they are expressed by the key details.
3. Analyze in detail how complex and multifaceted events, ideas, and characters unfold and interact over the course of the text.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. draw on specific details to describe how the events, characters, or setting develops over the course of the drama, narrative poem, or story
b. summarize the development of a theme and describe how that theme resonates throughout the text
c. weave together the details of texts to form a comprehensive understanding of its characters, including their overlapping or competing motivations
d. describe how the accumulation of specific phrases and images within poems contributes to a theme as a whole

Informational Text

a. demonstrate a command of the precise details of the exposition or argument, drawing on specific points to support an understanding of a part or the text as a whole
b. analyze the development of theses or explanations in texts and summarize succinctly the key relationships among ideas and supporting details

Observing craft and structure

Core Standards — Students can and do:

4. Interpret the meanings of words and phrases, including connotative and figurative meanings, and explain how specific word choices shape the meaning and tone of the text.
5. Analyze the structure of complex text and its parts, including how specific sentences, paragraphs, and larger portions build on each other and contribute to the whole of the text.
6. Compare and contrast the content and style of two or more texts written on similar topics or themes.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. analyze how the precise choice of words and phrases creates vivid images and sets the tone, mood, and theme of the text; compare the impact of words selected by the author to similar words with different connotations

b. explain how authors manipulate time (e.g., flashbacks, foreshadowing, pacing) to create suspense, mystery, or humor
c. evaluate how playwrights use soliloquies to portray the internal thinking and feeling of characters
d. compare and contrast similarities and differences in styles and forms of poems on a similar theme or topic

Informational Text

a. analyze how the author uses specific words and metaphors to establish tone or to make illuminating comparisons in an argument, explanation, or description
b. explain how the author structures information or an argument to emphasize key points and advance a point of view
c. analyze how different authors organize and categorize similar information and describe the impact of those different approaches

Integrating information and evaluating evidence

Core Standards — Students can and do:

7. Synthesize information presented graphically or visually in print, videos, or electronic texts with the information provided by the text.
8. Follow and evaluate the logic and reasoning of the text, including assessing whether the evidence provided is sufficient to support the claims.
9. Analyze the point of view or purpose represented in the text, assessing how it shapes the content, style, and tone.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. explain how a story unfolds when it is told by alternating or multiple narrators with different points of view
b. analyze literature in terms of its connection to related historical and cultural events and contexts

Informational Text

a. interpret complex, multifaceted, quantitative, or technical information presented in maps, charts, illustrations, graphs, and time lines
b. provide an account of an author's precise claims, including how specific assertions are defined and distinguished from opposing statements
c. analyze the explicit and implicit premises of an argument and determine if the conclusions reached are logically justified by the evidence presented in the text
d. compare how different authors construct and develop different points of views or perspectives on similar events or issues by assessing their assumptions, evidence, and reasoning

Developing habits for reading complex text

Core Standards — Students can and do:

10. Develop the habit of reading independently and productively, sustaining concentration and stamina to read increasingly demanding texts.

Writing and Research Standards

Writing to reflect audience, purpose, and task

Core Standards — Students can and do:

1. Write informative and explanatory texts and arguments that match purpose to task and address familiar as well as more distant, unknown and general audiences (e.g., peers, elected officials and policy makers, community members).

Conducting research

Core Standards — Students can and do:

2. Demonstrate proficiency at performing short, focused research projects as well as more sustained inquiries that demonstrate an increasing command of the subject under investigation.
3. Assemble evidence independently from authoritative and credible print and digital sources.
4. Assess the credibility, reliability, consistency, and accuracy of the information and sources gathered and determine the strengths and limitations of each source and avoiding over-reliance on any one source.
5. Represent and cite accurately the data, conclusions, and opinions of others, effectively incorporating them into one's own work while avoiding plagiarism.
6. Cite print or electronic sources correctly and document quotations, paraphrases, graphics, and other information using a standard format.

Revising writing

Core Standards — Students can and do:

7. Strengthen writing through revision, editing, or beginning again to ensure to ensure logical organization, precision of word choice, and coherence.

Using tools and technology

Core Standards — Students can and do:

8. Use technology and other tools to produce, revise, and distribute writing, as well as to interact online with others about writing, including responding to and providing feedback.

Developing proficiency in a range of writing

9. Create writing over extended timeframes (time for reflection and revision) and shorter timeframes (a single sitting or a day or two), responding to specific sources.

   Focus by grade level:

   Grade 9: Analyzing the content of literary or informational sources at the 9-10 grade band level of text complexity and content
   Grade 10: Comparing or evaluating the contents of literary or informational sources at the 9-10 grade band level of complexity and content

Standards — Students can and do (by key text type):[29]

Narratives

By high school, students are most often using narrative writing as a technique embedded within other genres. They use narrative writing to inform and persuade. They may, for example, provide a brief anecdote to support a point made in an argument or a scenario to illustrate an explanation. In such cases, narrative writing is a technique rather than a form in itself.

Informative and Explanatory Texts

a. provide a clear and coherent introduction that establishes the subject and conveys a knowledgeable stance
b. develop a complex subject through relevant and specific facts, concrete details, quotations, or other information and examples
c. organize complex information into categories that make clear distinctions and provide headings, figures, tables, and diagrams when useful
d. employ discipline-specific and technical vocabulary and maintain a formal, objective style
e. adapt strategies to present information and explanations (e.g., if/then, extended definitions, classification, comparison/contrast, and cause/effect) and employ them to manage the complexity of a topic
f. link ideas with transitions and by varying sentence structures to express relationships between ideas and create cohesion
g. emphasize the most significant information and confirm the accuracy of key points
h. provide a conclusion that articulates the implications and significance of the information or explanation

Arguments

a. establish a substantive claim and distinguish it from alternate or opposing claims
b. support claims with logical reasons
c. provide relevant and sufficient evidence from credible sources in support of the reasons
d. explain how the evidence links to the claim
e. develop the argument in part based on knowledge of the audience (e.g., building bridges by opening with areas of agreement)
f. convey relationships between reasons, as well as between reasons and evidence, and signal alternative claims using words, phrases, and clauses (e.g., *on the other hand*, *however*, *but*, *nevertheless*, *because*, *therefore*, *in addition*).
g. maintain a formal style when appropriate to the discipline or context
h. enhance the reliability of the argument by employing strategies such as paraphrasing or quoting explicitly from a credible, authoritative source
i. provide a concluding statement or section that enhances the argument, using strategies such as articulating the implications, summing up the key factors, or weighing the evidence to support the claim

Speaking and Listening Standards

Listening closely and participating productively

Core Standards — Students can and do:

1. Participate productively in a range of structured interactions—both interpersonally and in groups—exchanging information constructively and with confidence.

[29] See Appendix C for samples of student writing that illustrate through annotations the level of quality required to meet the writing standards.

2. Sustain concentration on complex information presented orally, visually, or multi-modally and confirm understanding by summarizing, analyzing, and elaborating on key ideas.

Standards — Students can and do (by key communication type):

Classroom discussions and collaboration

a. come to discussions having researched, studied, and taken notes on topics or issues under study and draw upon that preparation in discussions
b. determine the key ideas as well as the tone and mood of communications presented orally or through other media
c. ask questions to test the evidence that supports a speaker's claims and conclusions presented orally or through other media
d. build on essential information from others' input and respond constructively by making cogent and verifiable comments that aid in the furthering and deepening of discussions
e. integrate multiple streams of data presented through a variety of multi-modal media into a cohesive, meaningful understanding of the information
f. support productive teamwork by identifying the comments and claims made on all sides of an issue; evaluating the degree to which each claim is supported by evidence; sifting, summarizing, and putting to use the most important ideas developed by the group; and determining what additional information, research, and tasks are required in order to move the group towards its goals

Exchanging information and speaking effectively

Core Standards — Students can and do:

3. Present information and points of view, structuring and organizing comments to support their purposes and guide the listener.
4. Vary intonation and phrasing for emphasis and effect, demonstrating command of formal English when indicated or appropriate (e.g., presenting ideas versus class discussion).

Standards — Students can and do (by key communication type):

Presentation of ideas and information

a. organize and present complex information about situations, topics, or texts so that listeners can follow the line of thought by grouping related ideas, using transitional markers, and clarifying one's claims with evidence that is verifiable and accessible
b. align verbal (tone, phrasing, pacing) and nonverbal strategies (gestures and facial expressions) for emphasis and effect
c. make strategic use of multimedia elements and visual displays of data to enhance understanding
d. perform dramatic readings of various prose and poetry, speaking with clarity, fidelity, and responsiveness to the text, reflecting on syntax and diction for cues regarding emphasis and rhythm

Language Development Standards

Conventions

In high school, students gain a broad range of sophisticated language skills to enhance meaning, achieve stylistic effect, and create subtle links between and among ideas. They maintain parallel structure. They acquire a more conceptual understanding of usage and the limits of "rules." They use a full range of punctuation, including ellipses, semicolons,

colons, and hyphens, and have a fuller understanding of how to employ commas and dashes. They make use of a wide range of phrases and clauses for effect. They maintain a consistent style and tone, using a style manual appropriate to the discipline in which they are working to help conventionalize their writing.

Key Terms: colon, ellipses, hyphen, semicolon, parallel structure, verbal

Grammar and usage

Core Standards — Students can and do:

1. Use parallel structure in writing.
2. Consult references (e.g., *Merriam-Webster's Dictionary of English Usage*) as needed to resolve particular usage issues, particularly when the usage is contested.

Mechanics

Core Standards — Students can and do:

3. Use a comma to separate coordinate adjectives (e.g., *It was a fascinating, enjoyable movie* but not *He wore a light*[,] *blue suit*).
4. Use a comma, ellipses, or dash to indicate a pause or break.
5. Use a semicolon (and perhaps a conjunctive adverb) to link two or more closely related independent clauses.
6. Use a colon to introduce a list or a quotation.
7. Observe the conventions concerning using hyphens to join words.

Word choice and style

Core Standards — Students can and do:

8. Use various types of phrases (noun, verb, adjectival, adverbial, participial, prepositional, absolute) and clauses (independent, dependent; noun, relative, adverbial) to add variety and interest to writing.
9. Maintain consistency in style and tone.
10. Write and edit work so that it conforms to the guidelines in a style manual.

Focus by Grade-Level
Grade 9: Style (Conventions Standards #9, #10)
Grade 10: Advanced punctuation use (Conventions Standards #s 3-7)

Vocabulary

Key to students' vocabulary development is building rich and flexible word knowledge marked by multiple connections that link a word to similar words and to contexts and experiences that are related to that word—as compared to simply a definition. In high school, students continue to make use of a range of strategies to determine and clarify the meaning of unknown and multiple-meaning words. This repertoire now includes considering multiple levels of context (sentence, paragraph, and text levels) and the word's history. They habitually verify their inferences of word meanings. They interpret a wide range of figurative language found in what they read and consider its contribution to the text. Possessing a highly developed sense of the shadings among words with similar denotations,

they evaluate an author's or speaker's choice of words as well as alternatives to the words chosen. They acquire new words through interactive language use, including informal talk, discussion, reading and responding to text as well as by being taught the words directly. This includes a continuing focus on "Tier 2" words and phrases (those that commonly appear in writing but not in spoken language), "Tier 3" words and phrases (those that are specific and important to particular disciplines).

Determining the meaning of words

Core Standards — Students can and do:

1. Determine or clarify the meaning of an unknown word by using one or more of the following strategies:
   - using knowledge of roots, prefixes, and suffixes
   - using context, including syntactic and semantic clues, at the sentence, paragraph, and text levels
   - consulting reference materials, including general and specialized dictionaries and thesauruses, both print and digital
2. Determine the relevant meaning of multiple-meaning words by using context.
3. Verify the preliminary determination of a word's meaning (e.g., by checking the inferred meaning in context or by looking up the word in a dictionary).
4. Interpret figurative language and analyze its role within the text.

Understanding the nuances of words (denotations and connotations)

Core Standards — Students can and do:

5. Assess and explain the merits of the choice of one word over another in reading, writing, speaking, and listening.
6. Gain a clearer sense of a word's meaning and use by comparing it to other words with similar but not identical meanings (synonyms).

Acquiring vocabulary

Core Standards — Students can and do:

7. Acquire and use a grade-appropriate vocabulary of Tier 2 words taught directly and gained through reading.
8. Acquire and use a grade-appropriate vocabulary of Tier 3 words taught directly and gained through reading.

Grade 9 English Language Arts: Focus for Instruction

Reading and Literature

In grade 9, students apply the core reading standards to the following types of text: narratives, drama, poetry, and informational text. Students focus on learning to read 9-10 grade band text independently, with scaffolding likely required for texts at the high end of the range.

- Reading standards applied to different text types
- Mix of text types: Narratives, Drama, Poetry, Informational Text
- **Text Complexity focus:** 100% 9-10 Band Text

100%

Writing and Research

In grade 9, students apply the standards in writing to the following types of text: Narrative, Informative/Explanatory, and Argument. Students perform research, including short focused research tasks. They also write over various time frames in response to specific sources.

- Writing standards applied to different text types: Narrative, Informative/Explanatory, Argument
- Research, including short focused research tasks
- **Grade-specific focus: Grade-specific focus:** Students create writing over extended and shorter timeframes, responding to specific sources by analyzing the contents of literary or informational sources at the 9-10th grade band level of complexity and content.

Speaking and Listening

In grade 9, students apply the core speaking and listening standards in different contexts.

- Speaking and listening standards applied in different contexts: classroom discussion and collaboration as well as in presentations of ideas and information.

Language Development

In grade 9, students apply the language development standards by applying the core vocabulary standards to determine word meaning, understand word nuances, and acquire vocabulary and to produce writing and speaking that observes appropriate conventions.

- Vocabulary standards applied to reading, writing, speaking and listening
- **Grade-specific conventions focus:** Style
  - Maintain consistency … (Conventions Standard #9)
  - (Style manual)… (Conventions Standard #10)

Grade 10 English Language Arts: Focus for Instruction

Reading and Literature

In grade 10, students apply the core reading standards to the following types of text: narratives, drama, poetry, and informational text. Students focus on learning to read 9-10 grade band text independently as well as on sustained practice with 11-CCR band "stretch" texts, which will likely require scaffolding.

- Reading standards applied to different text types
- Mix of text types: Narratives, Drama, Poetry, Informational Text
- **Text Complexity focus:** 70% 9-10 Band Text; 30% 11-CCR text

70% 30%

Writing and Research

In grade 10, students apply the standards in writing to the following types of text: Narrative, Informative/Explanatory, and Argument. Students perform research, including short focused research tasks. They also write over various time frames in response to specific sources.

- Writing standards applied to different text types: Narrative, Informative/Explanatory, Argument
- Research, including short focused research tasks
- **Grade-specific focus:** Students create writing over extended and shorter timeframes, responding to specific sources by analyzing the contents of literary or informational sources at the 9-10th grade band level of complexity and content.

Speaking and Listening

In grade 10, students apply the core speaking and listening standards in different contexts.

- Speaking and listening standards applied in different contexts: classroom discussion and collaboration as well as in presentations of ideas and information.

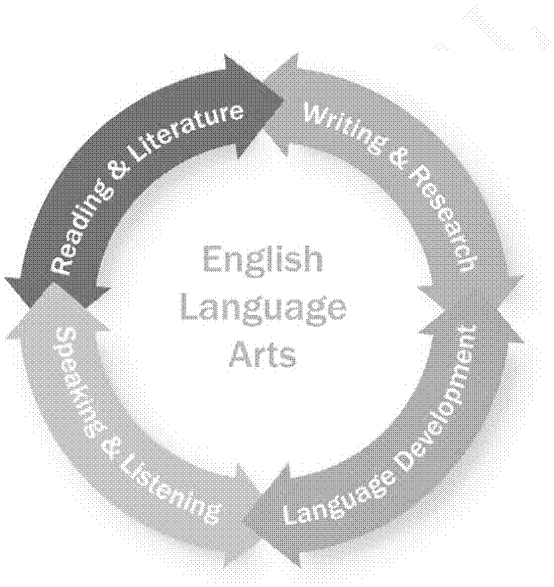
Language Development

In grade 10, students apply the language development standards by applying the core vocabulary standards to determine word meaning, understand word nuances, and acquire vocabulary and to produce writing and speaking that observes appropriate conventions.

- Vocabulary standards applied to reading, writing, speaking and listening
- **Grade-specific conventions focus:** Advanced Punctuation Use
  - Coordinate adjectives … (Conventions Standard #3)
  - Comma/dash/ellipsis… (Conventions Standard #4)
  - Semicolon … (Conventions Standard #5)
  - Colon … (Conventions Standard #6)
  - Hyphen … (Conventions Standard #7)

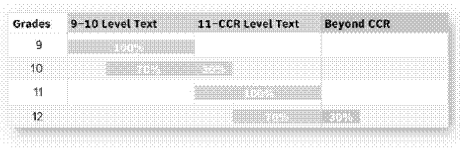
English Language Arts

Grades 11–CCR



Required Text Complexity by Grade

Proportion of Texts Within and Above Grade Band to be Read in Each Grad



While advancing through grades 11-12, students must engage with texts of steadily increasing complexity.

- **In grade 11**, students focus on reading texts in the 11-CCR grade band level with scaffolding likely required for texts at the high end of the range.
- **In grade 12**, students focus on reading texts in the 11-CCR grade band level (70 percent) independently and are introduced to texts in the "Beyond CCR" grade band level as "stretch" texts (30 percent), which will likely require scaffolding.

Determining Text Complexity for Grades 11–CCR[30]

Text complexity is determined by a mix of qualitative and quantitative measures of the text itself refined by teachers' professional judgment about the match of particular texts to particular students. The qualitative dimensions of text complexity are best understood as continua of increasing complexity rather than as representing discrete and easily defined stages. Most authentic texts will exhibit some but not all of the traits linked to a particular grade band; qualitatively assigning a text to a grade band is therefore a matter of "best fit," or determining which grade band's set of descriptors most accurately describes the text.

Qualitative Measures of Texts	Quantitative Measures of Texts
• *Structure:* Implicit, complex, unconventional; sophisticated graphic representations are essential to meaning; texts are sufficiently long to address complex subjects • *Purpose:* Multiple; often implicit and may be hidden or obscure • *Style and Language:* Unfamiliar, demanding, complex; many literary devices; extensive use of Tier 2 and 3 words and figurative language; language may be intentionally or unintentionally ambiguous • *Richness:* Many ideas/concepts; highly abstract; high information density • *Relationships:* Many implicit, complex, interwoven connections • *Knowledge Demands:* Ability to handle one or more complex themes, consider multiple and unusual perspectives, and understand experiences distinctly different from one's own; cultural and historical knowledge useful for understanding characters, settings, and allusions; extensive, perhaps specialized discipline-specific content knowledge	A study is underway with Cole-Metrix, a nonprofit research organization, to identify roughly five to seven computer-measurable dimensions of text cohesion. These dimensions, paired with a Lexile score, will yield a robust quantitative assessment of text complexity that, along with both the qualitative dimensions and professional judgment, will round out the Core Standards model of complexity.
Professional Judgment that weighs students' prior knowledge and life experiences, students' interests, motivations, and maturity level.	

[30] Adapted from ACT, Inc., (2005); Carnegie Council on Advancing Adolescent Literacy (2010); Chall, Bissex, Conrad, & Harris-Sharples (1996); and Hess and Biggam (2004)

Mix of Key Text Types for 11–CCR

Narratives	Drama	Poetry	Informational Text
At this level, includes the subgenres of adventure stories, biographies, memoirs, historical fiction, mysteries, science fiction, mysteries, myths, science fiction, realistic fiction, allegories, parodies, satire, and graphic novels.	*At this level, includes one-act and multi-act plays both in written form and on film.*	*At this level, includes the subgenres of narrative poems, lyrical poems, free verse, odes, ballads, and epics.*	*At this level, Includes such subgenres as exposition and argument in the form of essays, speeches, opinion pieces as well as other documents and digital media sources on a range of topics.*

Illustrative Texts for Narratives, Drama, and Poetry[31]

Pride and Prejudice by Jane Austen (1813)

Black Boy by Richard Wright (1945)

Their Eyes Were Watching God by Zora Neale Hurston (1937)

The Bluest Eye by Toni Morrison (1970)

The Namesake by Jhumpa Lahiri (2003)

The Importance of Being Earnest by Oscar Wilde (1895)

Death of a Salesman by Arthur Miller (1949)

"Ode on a Grecian Urn" by John Keats (1820)

"Because I Could Not Stop for Death" by Emily Dickinson (1890)

Illustrative Informational Texts

The Declaration of Independence by Thomas Jefferson (1776)**

The Crisis by Thomas Paine (1776)

Walden by Henry David Thoreau (1854)

"Politics and the English Language" by George Orwell (1946)

"Letter from a Birmingham Jail" by Martin Luther King (1963)**

"Mother Tongue" by Amy Tan (1990)

***Seminal historical texts that all students are expected to read**

[31] See Appendix B for other texts illustrative of Grades 11–CCR text complexity.

Reading and Literature Standards

Grasping specific details and key ideas

Core Standards — Students can and do:

1. Read the text closely to determine what the text says explicitly and to make logical inferences from it; cite text evidence to defend and challenge analyses in discussion and in writing.
2. Articulate the text's theses and themes and provide a summary that clarifies the relationships among ideas and the connections between key details.
3. Analyze in detail how complex and multifaceted events, ideas, and characters unfold and influence one another over the course of the text.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. analyze where the author chooses to focus and which details the author chooses to emphasize
b. analyze how multiple themes and ideas in the text interact and build on one another
c. evaluate the extent to which setting shapes the course of events and sets the mood
d. trace the origins and evolution of the traits, motivations, and relationships among characters and how they interact to influence the plot and its resolution
e. describe how the poet develops a central image, preoccupation, or idea through the accumulation of specific phrases and images

Informational Text

a. demonstrate an understanding of the precise elements of an author's explanation or argument, including the distinctions the author makes between different ideas or information
b. scrutinize the details within specific portions of texts and connect the insights gained to develop an understanding of the text as a whole
c. analyze how the text captures the interaction between complex ideas or multifaceted events

Observing craft and structure

Core Standards — Students can and do:

4. Interpret the meanings of words and phrases, including connotative and figurative meanings, and analyze how word choices have a significant effect on the meaning and tone of the text.
5. Analyze the ways the author chooses to structure the text, including how to present complex ideas and events and where to begin and end.
6. Compare and contrast the choices different authors make in treating similar topics or themes, including content, style, and tone.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. analyze how the author's use of language impacts the text, including the degree of formality of the diction and how it is evocative of a particular setting (e.g., a courtroom, a rural town)
b. evaluate how authors create meaningful ambiguity and multiple layers of meaning in poetry, drama, and other narratives
c. analyze how an author choice of where to begin a story, poem, or drama impacts the overall plot structure
d. contrast alternative treatments of the same dramatic work in different stage productions and evaluate how the directors' different interpretations relate to evidence within the script
e. analyze how the author draws upon and transforms fictional or historical source material (e.g., how Shakespeare draws on Plutarch or a story in Ovid)

Informational Text

a. describe how the choice of a particular word, phrase, or series of words can impact significantly the meaning of a document (e.g., contract, court opinion, essay)
b. evaluate how the author's choice of structure contributes to the effectiveness of the exposition or argument
c. compare and contrast presentations of the same topic in different media and describe the differences in focus, organization, and links to other sources

Integrating information and evaluating evidence

Core Standards — Students can and do:

7. Synthesize information presented graphically or visually in print, videos, or electronic texts and, when appropriate, note discrepancies of fact or interpretation (e.g., data in a table inconsistent with the author's analysis).
8. Rigorously evaluate the logic and reasoning of the text, including assessing whether the evidence provided is relevant and sufficient.
9. Analyze how the point of view or purpose develops in the text and explain how it is revealed in the key details.

Standards — Students can and do (by key text type):

Narratives, Drama, and Poetry

a. compare points of view from which different stories are told and trace how they shift within a story and influence characterization and plot
b. explain how dramatic irony created by the differences between what the audience or reader knows and what the characters know in a drama or narrative fiction creates suspense, anxiety, or humor

Informational Text

a. synthesize ideas and data presented graphically and determine their purpose and relationship to the rest of the text (print or digital), noting any inconsistencies or discrepancies between the two
b. evaluate the reasoning and rhetoric that support an argument or explanation, including assessing the sufficiency and relevance of the evidence as well as identifying any unsubstantiated statements or fallacious reasoning
c. analyze documents of historical and literary significance for their premises, perspectives, and logical structure

Developing habits for reading complex text

Core Standards — Students can and do:

10. Develop the habit of reading independently and productively, sustaining concentration and stamina to read increasingly demanding texts.

Writing and Research Standards

Writing to reflect audience, purpose, and task

Core Standards — Students can and do:

1. Write informative and explanatory texts and arguments that match purpose to task and are tailored to audiences with specific requirements (e.g., admissions officer, human resources officer, skeptical audience).

Conducting research

Core Standards — Students can and do:

2. Demonstrate proficiency at performing short, focused research projects as well as more sustained inquiries that synthesize multiple authoritative sources on a subject.
3. Analyze evidence independently gathered from multiple authoritative and credible print and digital sources.
4. Assess the credibility, reliability, consistency, and accuracy of the information and sources gathered and determine their usefulness and relevance for the specific audience, purpose, and task.
5. Represent and cite accurately the data, conclusions, and opinions of others, effectively incorporating them into one's own work while avoiding plagiarism.
6. Cite print or electronic sources correctly and document quotations, paraphrases, graphics, and other information using a standard format.

Revising writing

Core Standards — Students can and do:

7. Strengthen writing through revision, editing, or beginning again to ensure to ensure logical organization, precision of word choice, and coherence.

Using tools and technology

Core Standards — Students can and do:

8. Demonstrate command of technology and other tools to produce, revise, and distribute writing, as well as to interact online with others about writing, including responding to and providing feedback.

Developing proficiency in a range of writing

9. Create writing over extended timeframes (time for reflection and revision) and shorter timeframes (a single sitting or a day or two), responding to specific sources.

   Focus by grade level:

   Grade 11: Analyzing the content of literary or informational sources at the 11-CCR grade band level of text complexity and content
   Grade 12: Synthesizing or evaluating the contents of literary or informational sources at the 11-CCR grade band level of complexity and content

Standards — Students can and do (by key text type):[32]

Narratives

By high school, students are most often using narrative writing as a technique embedded within other genres. They use narrative writing to inform and persuade. They may, for example, provide a brief anecdote to support a point made in an argument or a scenario to illustrate an explanation. In such cases, narrative writing is a technique rather than a form in itself.

Informative and Explanatory Texts

a. provide a clear and coherent introduction that establishes the subject and conveys a knowledgeable stance
b. develop complex subjects through judicious use of relevant and specific facts, details, quotations, examples, or other information
c. organize and present information so that each new piece of information builds upon what precedes it to create a unified whole
d. demonstrate command of discipline-specific and technical vocabulary when appropriate and adjust style as appropriate to the situation
e. demonstrate control of a range of strategies to present complex information or explanations and employ them effectively to manage the complexity of the topic and accomplish the writer's purpose
f. link ideas with transitions and by varying sentence structures to express the precise relationships among ideas and create cohesion
g. provide a conclusion that articulates the implications and significance of the information or explanation

Arguments

a. establish the importance of the issue, make a substantive claim, and distinguish it from alternate or opposing claims
b. support claims with logical reasons
c. provide relevant, sufficient, and convincing evidence from credible sources in support of the reasons
d. make logical connections between the evidence and the claim
e. develop the argument in part based on an awareness of the audience's values, knowledge of the issue, and possible biases
f. convey relationships between reasons, as well as between reasons and evidence, and signal alternative claims using words, phrases and clauses (e.g., *on the other hand*, *however*, *but*, *nevertheless*, *because*, *therefore*, *in addition*)
g. maintain a formal style when appropriate to the discipline or context
h. enhance the credibility of the argument by demonstrating control of strategies, including paraphrasing or quoting from authoritative sources and citing logical consequences
i. provide a concluding statement or section that enhances the argument, using strategies such as articulating the implications, summing up the key factors, or weighing the evidence to support the claim

[32] See Appendix C for samples of student writing that illustrate through annotations the level of quality required to meet the writing standards.

Speaking and Listening Standards

Listening closely and participating productively

Core Standards — Students can and do:

1. Participate productively in a range of structured interactions—both interpersonally and in groups—exchanging information constructively and with confidence, adapting to different levels of formality.
2. Sustain concentration on complex information presented orally, visually, or multi-modally and confirm understanding by challenging or defending key ideas and supporting evidence.

Standards — Students can and do (by key communication type):

Classroom discussions and collaboration

a. come to discussions having formulated considered judgments on the topics or issues under study and draw upon that preparation in discussions
b. evaluate the content and rhetoric of a speaker, noting when evidence is exaggerated or distorted
c. ask questions that probe the reasoning and evidence that support the claims and conclusions made orally or through other media, including offering counter examples or other points of view
d. propel conversations forward by providing essential information and sharing findings that clarify, accommodate, or challenge ideas
e. synthesize information presented visually or digitally with other information presented orally, noting the effect on meaning of any discrepancies between the two presentations
f. assist in the formulation and productive functioning of both formal and informal self-directed work groups by identifying and assigning tasks and maintaining conversational norms as well as evaluating the progress of the team towards its goals

Exchanging information and speaking effectively

Core Standards — Students can and do:

3. Present information clearly and persuasively to others, selecting the most appropriate way to structure comments for clarity and effect.
4. Adapt delivery, tone, and mood for emphasis and effect, demonstrating command of formal English when indicated or appropriate (e.g., presenting ideas versus class discussion).

Standards — Students can and do (by key communication type):

Presentation of ideas and information

a. organize and present complex information about topics, situations, or texts, providing reliable and credible evidence from authoritative sources in support of findings and claims such that the line of reasoning is clear and alternative perspectives are addressed
b. shape delivery and message to the occasion and the audience's values, knowledge of the issue, and possible biases
c. engage an audience and improve comprehension through visual aids in presentations, including multimedia platforms
d. portray and explain various ways to perform dramatic readings of various prose and poetry, citing text evidence for the alternative readings

Language Development Standards

Conventions

In high school, students gain a broad range of sophisticated language skills to enhance meaning, achieve stylistic effect, and create subtle links between and among ideas. They maintain parallel structure. They acquire a more conceptual understanding of usage and the limits of "rules." They use a full range of punctuation, including ellipses, semicolons, colons, and hyphens, and have a fuller understanding of how to employ commas and dashes. They make use of a wide range of phrases and clauses for effect. They maintain a consistent style and tone, using a style manual appropriate to the discipline in which they are working to help conventionalize their writing.

Key Terms: colon, ellipses, hyphen, semicolon, parallel structure, verbal

Grammar and usage

Core Standards — Students can and do:

11. Use parallel structure in writing.
12. Consult references (e.g., *Merriam-Webster's Dictionary of English Usage*) as needed to resolve particular usage issues, particularly when the usage is contested.

Mechanics

Core Standards — Students can and do:

13. Use a comma to separate coordinate adjectives (e.g., *It was a fascinating, enjoyable movie* but not *He wore a light*[,] *blue suit*).
14. Use a comma, ellipses, or dash to indicate a pause or break.
15. Use a semicolon (and perhaps a conjunctive adverb) to link two or more closely related independent clauses.
16. Use a colon to introduce a list or a quotation.
17. Observe the conventions concerning using hyphens to join words.

Word choice and style

Core Standards — Students can and do:

18. Use various types of phrases (noun, verb, adjectival, adverbial, participial, prepositional, absolute) and clauses (independent, dependent; noun, relative, adverbial) to add variety and interest to writing.
19. Maintain consistency in style and tone.
20. Write and edit work so that it conforms to the guidelines in a style manual.

Focus by Grade-Level
Grade 11: Parallel structure and phrasing (Conventions Standards #1, #8)
Grade 12: Usage (Conventions Standard #2)

Vocabulary

Key to students' vocabulary development is building rich and flexible word knowledge marked by multiple connections that link a word to similar words and to contexts and experiences that are related to that word—as compared to simply a definition. In high school, students continue to make use of a range of strategies to determine and clarify the meaning of unknown and multiple-meaning words. This repertoire now includes considering multiple levels of context (sentence, paragraph, and text levels) and the word's history. They habitually verify their inferences of word meanings. They interpret a wide range of figurative language found in what they read and consider its contribution to the text. Possessing a highly developed sense of the shadings among words with similar denotations, they evaluate an author's or speaker's choice of words as well as alternatives to the words chosen. They acquire new words through interactive language use, including informal talk, discussion, reading and responding to text as well as by being taught the words directly. This includes a continuing focus on "Tier 2" words and phrases (those that commonly appear in writing but not in spoken language), "Tier 3" words and phrases (those that are specific and important to particular disciplines).

Determining the meaning of words

Core Standards — Students can and do:

1. Determine or clarify the meaning of an unknown word by using one or more of the following strategies:
   - using knowledge of roots, prefixes, and suffixes
   - using context, including syntactic and semantic clues, at the sentence, paragraph, and text levels
   - consulting reference materials, including general and specialized dictionaries and thesauruses, both print and digital
   - using the word's history (etymology)
2. Determine the relevant meaning of multiple-meaning words by using context.
3. Verify the preliminary determination of a word's meaning (e.g., by checking the inferred meaning in context or by looking up the word in a dictionary).
4. Interpret figurative language and analyze its role within the text.

Understanding the nuances of words (denotations and connotations)

Core Standards — Students can and do:

7. Assess and explain the merits of the choice of one word over another in reading, writing, speaking, and listening.
8. Gain a clearer sense of a word's meaning and use by comparing it to other words with similar but not identical meanings (synonyms).

Acquiring vocabulary

Core Standards — Students can and do:

7. Acquire and use an extensive vocabulary of Tier 2 words taught directly and gained through reading.
8. Acquire and use a grade-appropriate vocabulary of Tier 3 words taught directly and gained through reading.

Grade 11 English Language Arts: Focus for Instruction

Reading and Literature

In grade 11, students apply the core reading standards to the following types of text: narratives, drama, poetry, and informational text. Students focus on learning to read 11-CCR grade band text independently, with scaffolding likely required for texts at the high end of the range.

- Reading standards applied to different text types
- Mix of text types: Narratives, Drama, Poetry, Informational Text
- **Text Complexity focus:** 100% 11-CCR Band Text

100%

Writing and Research

In grade 11, students apply the standards in writing to the following types of text: Narrative, Informative/Explanatory, and Argument. Students perform research, including short focused research tasks. They also write over various time frames in response to specific sources.

- Writing standards applied to different text types: Narrative, Informative/Explanatory, Argument
- Research, including short focused research tasks
- **Grade-specific focus:** Students create writing over extended and shorter timeframes, responding to specific sources by analyzing the contents of literary or informational sources at the 11-CCR grade band level of complexity and content.

Speaking and Listening

In grade 11, students apply the core speaking and listening standards in different contexts.

- Speaking and listening standards applied in different contexts: classroom discussion and collaboration as well as in presentations of ideas and information.

Language Development

In grade 11, students apply the language development standards by applying the core vocabulary standards to determine word meaning, understand word nuances, and acquire vocabulary and to produce writing and speaking that observes appropriate conventions.

- Vocabulary standards applied to reading, writing, speaking and listening
- **Grade-specific conventions focus:** Parallel Structure and Phrasing
  - Use parallel structure in writing … (Conventions Standard #1)
  - Use various types of phrases… (Conventions Standard #8)

Grade 12 English Language Arts: Focus for Instruction

Reading and Literature

In grade 12, students apply the core reading standards to the following types of text: narratives, drama, poetry, and informational text. Students focus on learning to read 11-CCR grade band text independently as well as on sustained practice with Beyond CCR band "stretch" texts, which will likely require scaffolding.

- Reading standards applied to different text types
- Mix of text types: Narratives, Drama, Poetry, Informational Text
- **Text Complexity focus:** 70% 11-CCR Band Text; 30% Beyond CCR text

Writing and Research

In grade 12, students apply the standards in writing to the following types of text: Narrative, Informative/Explanatory, and Argument. Students perform research, including short focused research tasks. They also write over various time frames in response to specific sources.

- Writing standards applied to different text types: Narrative, Informative/Explanatory, Argument
- Research, including short focused research tasks
- **Grade-specific focus:** Students create writing over extended and shorter time frames, responding to specific sources by synthesizing or evaluating the contents of literary of informational sources of 11-CCR grade band level complexity and content.

Speaking and Listening

In grade 12, students apply the core speaking and listening standards in different contexts.

- Speaking and listening standards applied in different contexts: classroom discussion and collaboration as well as in presentations of ideas and information.

Language Development

In grade 12, students apply the language development standards by applying the core vocabulary standards to determine word meaning, understand word nuances, and acquire vocabulary and to produce writing and speaking that observes appropriate conventions.

- Vocabulary standards applied to reading, writing, speaking and listening
- **Grade-specific conventions focus:** Usage
  - Consult references … (Conventions Standard #2)

APPENDIX A

Text Complexity Next Steps

A key requirement of the Core Standards in Reading is that all students engage with texts of steadily increasing complexity as they advance through school. The Core Standards' model of *text complexity*—in the simplest terms, how easy or difficult a text is to read—blends qualitative and quantitative measures of inherent text difficulty with educators' knowledge of their students. All three elements should be considered together when evaluating a text's appropriateness for particular students.

Qualitative dimensions are aspects of text best measured by readers applying trained judgment to the evaluation task. These dimensions include the text's structure, format, and length; its purpose; its style and language; the quality, nature, and density of its ideas, concepts, and information; relationships among ideas, information, and characters in it; and the knowledge and experience demands it places upon readers.

Quantitative dimensions include not only those aspects of text traditionally measured by readability formulas—word length and sentence length—but also computer-assessable aspects of text cohesion. These include referential cohesion (the degree to which a text refers back to previous points) and word frequency.

The qualitative and quantitative measures of a text are balanced in the model by educators' *professional judgment* of the appropriateness of the text for particular students given their background knowledge, interests, and motivation. Harder texts may be appropriate for highly knowledgeable or motivated students, and easier texts may be suitable as a means for building struggling readers' skills up to required levels.

While the tools included in this draft and the forthcoming ones described below represent an important advance over those previously available, no measure or set of measures is perfectly accurate. The mandate is that the body of works that students study in a given year represent an appropriate level of complexity as defined by these standards.

Current and next steps

A qualitative rubric, derived from prior studies and refined through feedback from trained teacher-raters, is included in this draft to define some ways in which text complexity should increase as students move through the grades. The rubric can be used (in conjunction with forthcoming quantitative measures) to place individual texts into grade bands by complexity. The qualitative dimensions are best understood, however, as continua of increasing complexity rather than as representing discrete and easily defined stages. Most authentic texts will exhibit some but not all of the traits linked to a particular grade band; assigning a text to a grade band is therefore a matter of "best fit," or determining which grade band's set of descriptors most accurately describes the text.

The Core Standards work team is presently conducting a study with Coh-Metrix, a nonprofit research organization, to identify roughly five to seven computer-measurable dimensions of text cohesion. These dimensions, paired with a Lexile score, will yield a robust quantitative assessment of text complexity that, along with both the qualitative dimensions and professional judgment, will round out the Core Standards model of complexity. Graphically, these three elements will appear together in a "label" defining complexity for a given text.

Following the completion of that study in early 2010, the work team will oversee the development of a Web site designed to make the text complexity tools more user-friendly and broadly available. The site will contain a database of complexity information for a range of widely used texts, including links to texts and test passages of similar complexity. Educators will be able to input additional texts for evaluation and comment on the suitability of particular texts for particular groups of students. The overarching goal is to make text complexity a vital and easy-to-incorporate element of reading instruction.

Text Complexity Qualitative Scheme

Dimension of Text	Grade Span: 2–3	4–5	6–8	9–10	11–12
Structure	Explicit, simple, conventional; simple graphic representations are supplementary to meaning; texts are relatively short	Largely explicit and direct; graphic representations are supplementary to meaning; texts are of increasing length	Largely implicit and subtle; graphic representations are essential to meaning; texts are of increasing length	Implicit, subtle; graphic representations are essential to meaning; texts are of increasing length	Implicit, complex, unconventional; sophisticated graphic representations are essential to meaning; texts are sufficiently long to address complex subjects
Purpose	Single; explicitly stated	Single or twofold; clearly indicated	Single or multiple; subtly stated	Multiple; often implicit	Multiple; often implicit and may be hidden or obscure
Style and Language: Style	Familiar, accessible, plain; few literary devices	Moderately accessible; some literary devices	Moderately demanding; several literary devices	Demanding; many literary devices	Unfamiliar, demanding, complex; many literary devices
Style and Language: Language	Mostly clear, everyday language; limited use of Tier 2 and 3 words and figurative language	Some everyday language; some use of Tier 2 and 3 words and figurative language	Consistent use of Tier 2 and 3 words and figurative language	Extensive use of Tier 2 and 3 words and figurative language	Extensive use of Tier 2 and 3 words and figurative language; language may be intentionally or unintentionally ambiguous
Ideas	A few ideas/concepts; concrete; low information density	Some ideas/concepts; mostly concrete; moderate information density	Several ideas/concepts; mostly abstract; moderate information density	Several ideas/concepts; abstract; high information density	Many ideas/concepts; highly abstract; high information density
Organization	A few connections; explicit; simple	Some connections; largely explicit	Several connections; largely implicit	Several connections; implicit	Many connections; implicit; complex and interwoven
Knowledge Demands: Life experiences (literary texts)	Ability to handle simple themes and fantastical elements as well as draw upon common, everyday experiences	Ability to handle fairly simple themes, consider a perspective somewhat different from one's own, and understand unfamiliar experiences	Ability to handle fairly challenging themes, consider multiple perspectives, and understand unfamiliar experiences	Ability to handle challenging themes, consider multiple perspectives, and understand experiences distinctly different from one's own	Ability to handle one or more complex themes, consider multiple and unusual perspectives, and understand experiences distinctly different from one's own
Knowledge Demands: Cultural/literary knowledge (chiefly literary texts)	General background knowledge and familiarity with genre conventions required	Cultural and historical knowledge useful for understanding characters, settings, and allusions			
Knowledge Demands: Content/discipline knowledge (chiefly informational texts)	Some everyday and general content knowledge	Some general and discipline-specific content knowledge	Some discipline-specific content knowledge	Extensive discipline-specific content knowledge	Extensive, perhaps specialized discipline-specific content knowledge

Adapted from ACT, Inc., 2006; Carnegie Council on Advancing Adolescent Literacy 2010; Chall, Bissex, Conrad, & Harris-Sharples 1996; and Hiebert and Pearson 2004

The qualitative dimensions of text complexity are best understood as continua of increasing complexity rather than as representing discrete and easily defined stages. Most authentic texts will exhibit some but not all of the traits linked to a particular grade band; qualitatively assigning a text to a grade band is therefore a matter of "best fit," or determining which grade band's set of descriptors most accurately describes the text.

Structure

- Explicit, simple, conventional → Implicit, complex, unconventional
- Simple graphic representations → Sophisticated graphic representations
- Graphic representations supplementary to meaning → Graphic representations essential to meaning
- Relatively short texts → Texts sufficiently long to address complex subjects

Purpose

- Single purpose → Multiple purposes
- Explicitly stated → Often implicit and may be hidden or obscure

Style

- Familiar, accessible, plain → Unfamiliar, demanding, complex
- Few literary devices → Many literary devices

Language

- Mostly everyday language → Extensive use of Tier 2 and 3 words
- Limited use of figurative language → Extensive use of figurative language
- Clear language → Potentially ambiguous language

Richness

- A few ideas/concepts → Many ideas/concepts
- Concrete ideas/concepts → Abstract ideas/concepts
- Low information density → High information density

Relationships

- A few connections → Many connections
- Explicit connections → Implicit connections
- Simple connections → Complex, interwoven connections

Knowledge Demands: Life Experiences

- Simple themes → Complex themes
- Single theme → Multiple themes
- Common, everyday experiences and fantastical elements → Experiences distinctly different from one's own
- Single perspective like one's own → Multiple and unusual perspectives

Knowledge Demands: Cultural Knowledge

- General background knowledge and familiarity with genre conventions required → Cultural and historical knowledge useful

Knowledge Demands: Content/Discipline Knowledge

- Some everyday and general content knowledge → Extensive, perhaps specialized discipline-specific content knowledge

Definitions of Key Writing Types

Narrative

Narrative writing is organized by time. Time is central because narrative writing depicts events, whether real or imagined. Narrative writing is fundamental to novels, short stories, biographies, autobiographies, historical accounts, and plays. With practice, students' repertoire of narrative strategies expands and their control of them increases. Students learn to provide visual details of scenes, objects, or people; to depict specific actions (movements, gestures, postures, and expressions); to use dialogue and interior monologue in order to provide insight into the narrator's and characters' personalities and motives; and to manipulate pace in order to highlight the significance of certain events and create tension and suspense. Narrative writing serves a variety of purposes; frequently it is embedded in other kinds of writing, such as writing intended to inform, instruct, or persuade.

Informative/Explanatory Text

Informative/explanatory writing conveys information accurately. This kind of writing can serve one or more of several closely related purposes: to increase readers' knowledge of a subject, to help readers better understand a procedure or process, or to enhance readers' comprehension of a concept. Informative/explanatory writing addresses questions, such as questions about types (What are the different types of whales?), about components (What are the parts of a motor?), about aspects of a subject such as its size, function, or behavior (How big is the United States? What is an x-ray used for? How do penguins find food?), about how things work (How does a camera work?), and about why things happen (Why is Earth warming?). To produce this kind of writing, students draw on what they already know and on primary and secondary sources. With practice, students become better able to develop a controlling idea that supports coherence and focus, and they can select examples, facts, and details that are relevant. They are also able to employ a variety of techniques that writers use to convey information, such as naming, describing, or differentiating different types or parts; comparing or contrasting one subject with another; and relating an anecdote or scenario to illustrate a point.

Argument

The purpose of argument is to persuade in order to change the reader's point of view or to bring about some action on the reader's part. There are many techniques employed by writers to persuade readers—for example, appeals to emotions, appeals to common beliefs, and the creation of a believable authorial voice. However, the core of argument is logic and evidence. A logical argument convinces its audience of the merit and reasonableness of the claims and the proof offered in support of the claims. Writers of logical arguments provide credible evidence (facts and details) to support their assertions. Although young children are not able to produce fully developed logical arguments, they are developing a variety of ways to extend and elaborate their work around opinions or judgments. They provide examples, they offer reasons for their assertions, and they explain cause and effect. These kinds of expository structures are steps on the road to argument.

Conventions

Three goals undergird the Conventions standards:

(1) Students should have a carefully specified range of broadly useful terms in order to be precise in their discussions about language. Such key terms (noted below) should be defined in grade-appropriate ways for younger students and fleshed out more fully in later grades. (For guidance on this matter, see, for example, Brock Haussamen with Amy Benjamin, Martha Kolln, and Rebecca S. Wheeler, *Grammar Alive!: A Guide for Teachers* [Urbana, IL: NCTE, 2003] and Amy Benjamin with Tom Oliva, *Engaging Grammar: Practical Advice for Real Classrooms* [Urbana, IL: NCTE, 2007].) Additional terminology may be helpful in particular instructional situations; avoiding terminology altogether may be appropriate in others.

(2) Students must be able to observe the conventions of standard English in their formal writing and speaking for the sake of having their efforts widely understood and taken seriously.

(3) Students need to understand that effective language use is more than simply observing a series of rules but also about making careful choices among alternatives, considering those choices in relation to task, purpose, audience, occasion, and discipline.

Many conventions-related issues are likely to arise in students' writing and speaking prior to their formal appearance in the sequence below. For example, students in kindergarten are expected to know what a complete sentence is even though the concept of a fragment is not mentioned specifically in the standards until grade 3.

Conversely, many skills and understandings introduced at lower grades will require continued attention as students advance in the grades. Students in grade 3, for instance, can ensure subject-verb agreement in simple situations, such as when the subject and verb appear next to each other in a sentence. As students' writing and speaking become more complex, however, new agreement challenges arise, such as intervening phrases suggesting a different number for the verb than the subject calls for. "Errors" with applying previously mastered skills and understandings are thus often a sign of progress in that students are stretching their ability to communicate. "Relearning" is then a matter of students becoming able to apply old skills and understandings in new, more sophisticated ways.

While all the Conventions standards should be considered cumulative, certain ones, noted with an asterisk (*), are particularly likely to need to be revisited by older students as they convey ever more elaborate ideas in writing and speech.

ELA Conventions Progressive Skills: By Standard

The following standards, marked with an asterisk (*) in the standards document, are skills and understandings that require continued attention in higher grades (after their introduction in lower grades) as they are applied to increasingly sophisticated writing and speaking.

Grade 3	Grades 4–5	Grades 6–8	(Grade/band in which the standard is introduced)
3.1			Generate complete sentences, avoiding sentence fragments, comma splices, and run-ons.
3.2			Ensure subject-verb and pronoun-antecedent agreement.
3.7			Choose words for effect.
	4–5.2		Recognize and correct inappropriate shifts in verb tense.
	4–5.3		Form and choose between adjectives and adverbs (including comparative and superlative forms), placing them appropriately within the sentence.
	4–5.4		Correctly use frequently confused words.
	4–5.5		Use idiomatic language.
	4–5.7		Use punctuation to separate items in a series.
	4–5.11		Spell grade-appropriate words correctly, consulting references as needed.
	4–5.12		Use specialized, topic-specific language to convey ideas precisely.
	4–5.13		Use figurative language to create images or make comparisons and connections between people, objects, or ideas.
	4–5.14		Use punctuation for effect.
	4–5.15		Expand, combine, and reduce sentences for meaning, reader/listener interest, and style.
		6–8.2	Place phrases and clauses within a sentence, avoiding misplaced and dangling modifiers.
		6–8.4	Recognize and correct inappropriate shifts in pronoun number and person.
		6–8.5	Recognize and correct vague pronouns with unclear or ambiguous antecedents.
		6–8.8	Recognize and correct inappropriate shifts in verb voice and mood.
		6–8.9	Set off nonrestrictive/parenthetical elements with commas, parentheses, or dashes.
		6–8.12	Vary sentence patterns for meaning, reader/listener interest, and style.
		6–8.13	Choose words and phrases to express ideas precisely and concisely, avoiding redundancy and wordiness.

Vocabulary Instruction

> Words are not just words. They are the nexus — the interface — between communication and thought. When we read, it is through words that we build, refine, and modify our knowledge. What makes vocabulary valuable and important is not the words themselves so much as the understandings they afford.
>
> Marilyn Adams[13]

The importance of students acquiring a rich and varied vocabulary cannot be overstated. Research suggests that if students are going to grasp and retain words and comprehend text, they need incremental, repeated exposure to words they are trying to learn in a variety of contexts. When students make multiple connections between new words and their own experiences they develop a nuanced and flexible understanding of the word. In this way, students learn not only what a word means, but how to use that word in a variety of contexts and apply appropriate senses of the word's meaning in order to understand different contexts.[14]

Initially children readily learn words from oral conversation because oral conversations are context rich in ways that aid in vocabulary acquisition: in discussion a small set of words (accompanied by gesture and intonation) is used with great frequency to talk about a narrow range of situations children are exposed to on a day to day basis. Yet as children reach school age, new words are less frequently introduced in conversation, and consequently vocabulary acquisition eventually stagnates by fourth or fifth grade unless students acquire additional words from written context.[15]

Written language, by contrast, contains hundreds of times as many different words as are typically used in conversational language. Yet writing lacks the interactive opportunities and nonverbal context provided by oral conversation so it presents a special challenge towards successful vocabulary acquisition without purposeful and ongoing concentration on vocabulary.[16] In fact, at most, between five and fifteen percent of new words encountered when reading are retained.[17] The weaker a student's vocabulary is, the slighter the gain.[18] Yet research shows that if students are going to understand what they read, they must understand upward of 95 percent of the words. [19]

As this "tipping point" for lexical dexterity is quite challenging for students to reach, every classroom needs to focus on providing students with high quality contextual encounters with vocabulary words that epitomize what they encounter in written texts. The aim should be to expose students to words that have the widest application—concepts that students are likely to meet again and again not just in classroom settings but outside the school walls as well. Some of these highly transferable academic words, often referred to as Tier 2 words, such as qualifying adjectives and adverbs (e.g., important, typically) are used broadly across domains and indeed in contexts that transcend the classroom.[40] However, the meanings of most words are specific to their domains—often referred to as Tier 3 words—including those that arise in multiple domains (e.g., chemical constituents, constituent voting patterns). To learn words, students have to read multiple selections from multiple authors within key domains of learning.

The problem is that, in any given instance, it is not the entire spectrum of a word's history, meanings, usages, and features that matters, but only those aspects that are relevant to the surrounding context. That means, first, that the reader's internal representation of the word must be sufficiently complete and well-articulated so that the intended meaning is available and, second, that the reader must understand the context well enough to select the intended meaning – which, in turn, depends on good understanding of the surrounding words of the passage.

Key to students' vocabulary development is building rich and flexible word knowledge. Students need plentiful opportunities to use and respond to the words they learn, through playful informal talk, discussion, and reading or being read to and responding to what is read. Along with attention to academic (Tier 2 words) and content-specific words (Tier 3 words), students benefit from instruction about the connections and patterns in language. Developing in students an analytical attitude toward the logic and sentence structure of their texts alongside an awareness of word parts, word origins, and word relationships provides students with a sense of how language works so that syntax, morphology and etymology can become useful cues to word in building meaning as students encounter new words and concepts in their reading.[41] As students are exposed to and interact with language throughout their school careers, they are able to acquire understandings of word meanings, build awareness of the workings of language, and apply word meanings to comprehend and produce language.

---

[13] Adams, M. (2009). "The Challenge of Advanced Texts: The Interdependence of Reading and Learning," in Hiebert (Ed.), Reading more, reading better: Are American students reading enough of the right stuff?, New York: Guilford Publications.

[14] Landauer, TK, McNamara, DS, Dennis, S and Kintsch, W (2007) Handbook of Latent Semantic Analysis; Landauer, T. K., & Dumais, S. T. (1997). A solution to Plato's problem: The latent semantic analysis theory of acquisition, induction, and representation of knowledge. *Psychological Review, 104(2)*, 211-240; Nagy, W. E., Herman, P., & Anderson, R. C. (1985). Learning words from context. *Reading* Research Quarterly, 20, 233-253.

[15] Hayes, D and Ahrens, M: "Vocabulary simplification for children: A special case of 'motherese?' Journal of Child Language. Vol 15(2), Jun 1988, 395-410

[16] Ibid.

[17] Ibid.

[18] Daneman & Green, 1986; Herman, Anderson, Person &Nagy, 1987; Sternberg & Powell

[19] Betts, E. A. (1946). *Foundations of reading instruction.* New York, NY: American Book Company; Carver, R. P. (1994). Percentage of unknown vocabulary words in text as a function of the relative difficulty of the text: Implications for instruction. *Journal of Reading Behavior, 26,* 413-437; Hu, M., & Nation, P. (2000). Unknown vocabulary density and reading comprehension. *Reading in a Foreign Language, 13(1),* 403-430; Laufer, B. (1988). What percentage of text-lexis is essential for comprehension. In C. Lauren & M. Nordmann (Eds.), *Special language: From humans to thinking machines,* pp. 316-323. Clevedon, UK: Multilingual Matters.

[40] Indeed, the fact that these words transcend specific disciplines argues for them being taught and used across the curriculum by all teachers.

[41] Beck, I. L., McKeown, M. & Kucan, L. (2008). *Creating robust vocabulary: Frequently asked questions and extended examples.*

APPENDIX B

Exemplars of Reading Text Complexity and Quality, ELA K–12

Selecting Text Samples

The following text samples primarily serve to exemplify the level of complexity and quality that the *Standards* require all students in a given grade band to engage with while additionally suggesting the breadth of text types that students should encounter. The choices should serve as useful guideposts in helping educators select texts of similar **complexity**, **quality**, and **breadth** for their own classrooms. The process of text selection was guided by these criteria in the following fashion:

- *Complexity.* Appendix A describes in detail a three-part model of measuring text complexity based on qualitative and quantitative indices of inherent text difficulty balanced with educators' professional judgment. In selecting texts to serve as exemplars, the work group began by soliciting contributions from teachers, educational leaders, and researchers who have experience working with students in the grades for which the texts have been selected. These contributors were asked to propose texts that they or their colleagues have used successfully with students in a given grade band. The work group made final selections based in part on whether qualitative and quantitative measures identified by the *Standards* indicated that the proposed texts were of sufficient complexity for the grade band. For those types of texts—particularly poetry and multimedia sources—for which these measures are not as well suited, professional judgment necessarily played a greater role in selection.

- *Quality.* While it is possible to have high-complexity texts of low inherent quality, the work group solicited only texts of recognized value. From the pool of submissions gathered from outside contributors, the work group selected classic or historically significant texts as well as contemporary works of comparable literary merit, cultural significance, and/or content richness.

- *Breadth.* After identifying texts of appropriate complexity and quality, the work group applied a range of secondary criteria to ensure that the samples presented in each band represented as broad a range of sufficiently complex, high-quality texts as possible. Among the factors considered were initial publication date, authorship, and subject matter.

Copyright and Permissions

For those exemplar texts not in the public domain, the work group is seeking permission from the rights holders for limited use by the Common Core State Standards Initiative of the National Governors Association.

While we await permissions grants from the rights holders, we will make use of texts under a conservative interpretation of Fair Use, which allows limited, partial use of copyrighted text for a nonprofit, educational purpose as long as that purpose does not impair the rights holder's ability to seek a fair return for his or her work.

Please note that these texts are included solely as exemplars in support of the *Standards*. Any additional use of those texts that are not in the public domain, such as for classroom use or curriculum development, requires independent permission from the rights holders. The texts may not be copied or distributed in any way other than as part of the overall Common Core Standards Initiative document.

Organization and Excerpting

Texts are organized first by category, with narrative texts followed by drama and poetry and then the informational texts. Within each category, the texts are organized by date, usually of first publication, beginning with the oldest and ending with the most recent. In some cases, the date of any given work may be open to debate.

The excerpts given here are meant to stand in for the full work in most instances. Works that are not in the public domain may be represented by short excerpts or snippets while the work group awaits permission from the rights holders for full use.

Media Texts

Selected excerpts are accompanied by annotated links to related media texts available online at the time of the publication of this document.

Kindergarten to Grade 1 Exemplar Texts

Narratives

Little Bear by Else Holmelund Minarik, illustrated by Maurice Sendak (1957)

Are You My Mother? by P. D. Eastman (1960)

The Fire Cat by Esther Averill (1960)

Green Eggs and Ham by Dr. Seuss (1960)

Put Me in the Zoo by Robert Lopshire (1960)

Frog and Toad Together by Arnold Lobel (1971)

Owl at Home by Arnold Lobel (1975)

Henry and Mudge: The First Book of Their Adventures by Cynthia Rylant, illustrated by Sucie Stevenson (1987)

Poppleton in Winter by Cynthia Rylant, illustrated by Mark Teague (2001)

Cowgirl Kate and Cocoa by Erica Silverman, illustrated by Betsy Lewin (2005)

Poetry

"Mix a Pancake" by Christina G. Rossetti (1893)

"Singing-Time" by Rose Fyleman (1919)

"Halfway Down" by A. A. Milne (1924)

"As I Was Going to St. Ives" by Unknown, collected by Peter and Iona Opie (1951)

"Drinking Fountain" by Marchette Chute (1957)

"Poem" by Langston Hughes (1958)

"Wouldn't You?" by John Ciardi (1961)

"In the Falling Snow" by Richard Wright (1973)

"Covers" by Nikki Giovanni (1980)

"It Fell in the City" by Eve Merriam (1985)

"Celebration" by Alonzo Lopez (1993)

"Two Tree Toads" by Jon Agee (2009)

Informational Texts

A Tree Is a Plant by Clyde Robert Bulla, illustrated by Stacey Schuett (1960)

My Five Senses by Aliki (1962)

Starfish by Edith Thacher Hurd, illustrated by Robin Brickman (1962)

What Do You Do With a Tail Like This? by Steve Jenkins & Robin Page (2003)

From Seed to Pumpkin by Wendy Pfeffer, illustrated by James Graham Hale (2004)

Mouse in a Meadow by John Himmelman (2005)

Petting Zoo by Dorling Kindersley (2005)

Meet the Meerkat by Darrin Lunde, illustrated by Patricia J. Wynne (2007)

"The Forest in Spring" in National Geographic Young Explorer! April 2009 (2009)

"Our Good Earth" in National Geographic Young Explorer, April 2009 (2009)

Read-Aloud Narratives

The Wonderful Wizard of Oz by L. Frank Baum (1900)

Little House in the Big Woods by Laura Ingalls Wilder, illustrated by Garth Williams (1932)

Mr. Popper's Penguins by Richard Atwater (1938)

Finn Family Moomintroll by Tove Jansson, translated by Elizabeth Portch (1948)

A Story A Story by Gail E. Haley (1970)

The Paper Crane by Molly Bang (1985)

Read-Aloud Poetry

"The Owl and the Pussycat" by Edward Lear (1871)

"April Rain Song" by Langston Hughes (1932)

"The Fox's Foray" – Traditional rhyme in Opie / *The Oxford Nursery Rhyme Book* (1955)

Over in the Meadow by John Langstaff, illustrated by Feodor Rojankovsky (1957)

Zin! Zin! Zin! a Violin by Lloyd Moss, illustrated by Marjorie Priceman (1995)

Read-Aloud Informational Texts

The Year at Maple Hill Farm by Alice and Martin Provensen (1978)

Fire! Fire! by Gail Gibbons (1984)

Follow the Water from Brook to Ocean by Arthur Dorros (1991)

Amazing Whales! by Sarah L. Thomson (2005)

Living Sunlight: How Plants Bring the Earth to Life by Molly Bang & Penny Chisholm, illustrated by Molly Bang (2009)

Grades 2–3 Exemplar Texts

Narratives

My Father's Dragon by Ruth Stiles Gannett, illustrated by Ruth Chrisman Gannett (1948)

Crow Boy by Taro Yashima (1955)

Amos & Boris by William Steig (1971)

The Treasure by Uri Shulevitz (1978)

The Stories Julian Tells by Ann Cameron (1981)

Sarah, Plain and Tall by Patricia MacLachlan (1985)

Tops and Bottoms by Janet Stevens (1995)

The Raft by Jim LaMarche (2000)

The Lighthouse Family: The Storm by Cynthia Rylant, illustrated by Preston McDaniels (2002)

The One-Eyed Giant (Book One of Tales from the Odyssey) by Mary Pope Osborne (2002)

Poetry

"Autumn" by Emily Dickinson (1893)

"Who Has Seen the Wind" by Christina G. Rossetti (1893)

"Afternoon on a Hill" by Edna St. Vincent Millay (1917)

"Stopping by Woods on a Snowy Evening" by Robert Frost (1923)

"Something Told the Wild Geese" by Rachel Field (1934)

"Grandpa's Stories" by Langston Hughes (1938)

"A Bat Is Born" by Randall Jarrell (1964)

"Knoxville, Tennessee" by Nikki Giovanni (1968)

"Weather" by Eve Merriam (1969)

"Eating While Reading" by Gary Soto (1995)

Informational Texts

A Medieval Feast by Aliki (1983)

Maps & Globes by Jack Knowlton, pictures by Harriet Barton (1985)

Sunshine Makes the Seasons by Franklyn M. Branley (1985)

From Seed to Plant by Gail Gibbons (1991)

Throw Your Teeth on the Roof: Tooth Traditions Around the World by Selby B. Beeler, illustrated by G. Brian Karas (1998)

So You Want to Be President? By Judith St. George, illustrated by David Small (2000)

Boy, Were We Wrong About Dinosaurs by Kathleen V. Kudlinski, illustrated by S.D. Schindler (2005)

Bat Loves the Night by Nicola Davies, illustrated by Sarah Fox-Davies (2008)

Moonshot: The Flight of Apollo 11 by Brian Floca (2009)

Where Do Polar Bears Live? by Sarah L. Thomson, illustrated by Jason Chin (2010)

Read-Aloud Narratives

"How the Camel Got His Hump" in *Just So Stories* by Rudyard Kipling (1902)

The Thirteen Clocks by James Thurber (1950)

The Cricket in Times Square by George Selden, illustrated by Garth Williams (1960)

The Search for Delicious by Natalie Babbitt (1969)

Bud, Not Buddy by Christopher Paul Curtis (1999)

Read-Aloud Poetry

"The Jumblies" by Edward Lear (1871)

"The Pied Piper of Hamelin" by Robert Browning (1888)

"Your World" by Georgia Douglas Johnson (1918)

"The Song of the Jellicles" by T.S. Eliot (1939)

"Fireflies" by Paul Fleischman, illustrated by Eric Beddows (1988)

Read-Aloud Informational Texts

Lincoln: A Photobiography by Russell Freedman (1987)

A Drop of Water: A Book of Science and Wonder by Walter Wick (1997)

The Museum Book: A Guide to Strange and Wonderful Collections by Jan Mark, illustrated by Richard Holland (2007)

What the World Eats by Faith D'Aluisio, photographed by Peter Menzel (2008)

Wild Tracks! A Guide to Nature's Footprints by Jim Arnosky (2008)

Grades 4–5 Exemplar Texts

Narratives

Alice in Wonderland by Lewis Carroll (1865)

The Secret Garden by Frances Hodgson Burnett (1911)

The Black Stallion by Walter Farley (1941)

The Little Prince by Antoine de Saint-Exupery (1943)

Tuck Everlasting by Natalie Babbitt (1975)

"Zlateh the Goat" by Isaac Bashevis Singer (1984)

M. C. Higgins, the Great by Virginia Hamilton (1993)

The Birchbark House by Louise Erdrich (1999)

Bud, Not Buddy by Christopher Paul Curtis (1999)
[Also a read-aloud narrative at Grades 2–3]

Where the Mountain Meets the Moon by Grace Lin (2009)

Poetry

"The Echoing Green" from *Songs of Innocence* by William Blake (1789)

"The New Colossus" by Emma Lazarus (1883)

"Casey at the Bat" by Ernest Lawrence Thayer (1888)

"A Bird Came Down the Walk" by Emily Dickinson (1893)

"Fog" by Carl Sandburg (1916)

"Dust of Snow" by Robert Frost (1923)

"Little Red Riding Hood and the Wolf" by Roald Dahl (1982)

"They Were My People" by Grace Nichols (1988)

"Words Free As Confetti" by Pat Mora (1996)

Informational Texts

Discovering Mars by Melvin Berger (1992)

Let's Investigate Marvelously Meaningful Maps by Madelyn Wood Carlisle (1992)

Hurricanes: Earth's Mightiest Storms by Patricia Lauber (1996)

The Kid's Guide to Money by Steve Otfinoski (1996)

Toys: Amazing Stories behind Some Great Inventions by Don Wulffson (2000)

"Good Pet, Bad Pet" by Elizabeth Schleichert from *Ranger Rick* (2002)

"Ancient Mound Builders" by E. Barrie Kavash from *Cobblestone* (2003)

About Time: A First Look at Time and Clocks by Bruce Koscielniak (2004)

England the Land by Erinn Banting (2004)

A History of US by Joy Hakim (2005)

My Librarian Is a Camel by Margriet Ruurs (2005)

Horses by Seymour Simon (2006)

Quest for the Tree Kangaroo by Sy Montgomery (2006)

Volcanoes by Seymour Simon (2006)

We Are the Ship: The Story of Negro League Baseball by Kadir Nelson (2008)

"Kenya's Long Dry Season" by Nellie Gonzalez Cutler from *Time for Kids* (2009)

"Seeing Eye to Eye" by Leslie Hall from *National Geographic Explorer* (2009)

"Computer" from *Britannica Junior Encyclopedia* (2010)

"Telescopes" by Ronan, Colin A. from *The New Book of Knowledge* (2010)

"Underground Railroad" by Henrietta Buckmaster from *The New Book of Knowledge* (2010)

Grades 6–8 Exemplar Texts

Narratives

Little Women by Louisa May Alcott (1869)

The Adventures of Tom Sawyer by Mark Twain (1876)

A Wrinkle in Time by Madeline L'Engle (1962)

The Dark is Rising by Susan Cooper (1973)

Dragonwings by Laurence Yep (1975)

Roll of Thunder, Hear My Cry by Mildred Taylor (1976)

"The People Could Fly" from *The People Could Fly: American Black Folktales* by Virginia Hamilton (1985)

The Tale of the Mandarin Ducks by Katherine Paterson (1990)

"Eleven" from *Woman Hollering Creek: And Other Stories* by Sandra Cisneros (1992)

Black Ships Before Troy: The Story of the Iliad by Rosemary Sutcliff (1993)

Drama

A Midsummer Night's Dream by William Shakespeare (1596)

The Diary of Anne Frank by Frances Goodrich and Albert Hackett (1958)

Poetry

"Paul Revere's Ride" by Henry Wadsworth Longfellow (1861)

"O Captain, My Captain" by Walt Whitman (1865)

"Jabberwocky" by Lewis Carroll (1872)

"Twelfth Song of Thunder" from *The Mountain Chant: A Navajo Ceremony* Navajo tradition (1887)

"The Railway Train" by Emily Dickinson (1893)

"The Song of Wandering Aengus" by W. B. Yeats (1899)

"Chicago" from *Chicago Poems* (1914) by Carl Sandburg

"Stopping by a Wood on a Snowy Evening" by Robert Frost (1923)

"I, Too" by Langston Hughes (1925)

"The Book of Questions" by Pablo Neruda (1973) translated by William O'Daly

"Oranges" from *Black Hair* (1985) by Gary Soto

"A Poem for My Librarian, Mrs. Long" from *Acolytes* (2007) by Nikki Giovanni

Informational Texts (English Language Arts)

"Allegory of the Cave" from *The Republic* by Plato (380 BCE) translated by G.M.A. Grube

"Letter on Thomas Jefferson" by John Adams (1822)

Narrative of the Life of Frederick Douglass an American Slave by Frederick Douglass (1845)

"Gettysburg Address" by Abraham Lincoln (1863)

"Lee Surrenders to Grant" by Horace Porter (1865)

"Blood, Toil, Tears and Sweat" by Winston Churchill (1940)

Travels with Charley: In Search of America by John Steinbeck (1962)

"Address to the Nation on Civil Rights" by John F. Kennedy (1963)

I Know Why the Caged Bird Sings by Maya Angelou (1969)

"Address to Students at Moscow State University" by Ronald Reagan (1988)

Grades 9-10 Exemplar Texts

Narratives

The Odyssey by Homer (8th century B.C.E.) translated by Robert Fagles

"The Nose" by Nikolai Gogol (1836) translated by Ronald Wilks

"The Gift of the Magi" by O. Henry (1906)

The Grapes of Wrath by John Steinbeck (1939)

Fahrenheit 451 by Ray Bradbury (1953)

"I Stand Here Ironing" by Tillie Olsen (1956)

The Killer Angels by Michael Shaara (1975)

The Joy Luck Club by Amy Tan (1989)

In the Time of the Butterflies by Julia Alvarez (1994)

The Book Thief by Marcus Zusak (2005)

Drama

The Tragedy of Romeo and Juliet by William Shakespeare (1592)

The Glass Menagerie by Tennessee Williams (1944)

Rhinoceros by Eugene Ionesco (1959) translated by Derek Prouse

Master Harold...and the Boys by Athol Fugard (1982)

Poetry

"Song" by John Donne (1635)

"Ozymandias" by Percy Bysshe Shelley (1810)

"The Raven" by Edgar Allen Poe (1845)

"We Grow Accustomed to the Dark" by Emily Dickinson (1893)

"Loveliest of Trees" by A. E. Houseman (1896)

"Lift Ev'ry Voice and Sing" by James Weldon Johnson (1900)

"Domination of Black" by Wallace Stevens (1916)

"Yet Do I Marvel" by Countee Cullen (1925)

"Women" by Alice Walker (1970)

"I Am Offering This Poem to You" by Jimmy Santiago Baca (1977)

Informational Texts (English Language Arts)

"Preface to Lyrical Ballads" by William Wordsworth (1800)

"Speech to the Second Virginia Convention" by Patrick Henry (1775)

"Second Inaugural Address" by Abraham Lincoln (1865)

"State of the Union Address" by Franklin Delano Roosevelt (1941)

"I Am an American Day Address" by Learned Hand (1944)

"Remarks to the Senate in Support of a Declaration of Conscience" by Margaret Chase Smith (1950)

"Address at the March on Washington" by Martin Luther King, Jr. (1963)

"Nobel Prize Acceptance Speech" by Elie Wiesel (1986)

"A Quilt of a Country" by Anna Quindlen (2001)

Grades 11-12 Exemplar Texts

Narratives

Pride and Prejudice by Jane Austen (1813)

Jane Eyre by Charlotte Brontë (1848)

"At Home" by Anton Chekov (1887) translated by Constance Garnett

The Great Gatsby by F. Scott Fitzgerald (1925)

As I Lay Dying by William Faulkner (1930)

Their Eyes Were Watching God by Zora Neale Hurston (1937)

Black Boy by Richard Wright (1945)

The Adventures of Augie March by Saul Bellow (1949)

The Bluest Eye by Toni Morrison (1970)

Dreaming in Cuban by Cristina García (1992)

The Namesake by Jhumpa Lahiri (2003)

Drama

Macbeth by William Shakespeare (c1611)

The Importance of Being Earnest by Oscar Wilde (1895)

Death of a Salesman by Arthur Miller (1949)

A Raisin in the Sun by Lorraine Hansberry (1959)

Poetry

"A Valediction Forbidding Mourning" by John Donne (1633)

"Ode on a Grecian Urn" by John Keats (1820)

"Song of Myself" from *Leaves of Grass* by Walt Whitman (c1860)

"Because I Could Not Stop for Death" by Emily Dickinson (1890)

"Mending Wall" by Robert Frost (1914)

"Ode to My Suit" by Pablo Neruda (1954) translated by Margaret Sayers Peden

"Sestina" by Elizabeth Bishop (1983)

"The Latin Deli: An Ars Poetica" by Judith Ortiz Cofer (1988)

"Demeter's Prayer to Hades" by Rita Dove (1995)

"Man Listening to Disc" by Billy Collins (2001)

Informational Texts (English Language Arts)

The Declaration of Independence by Thomas Jefferson (1776)

The Crisis by Thomas Paine (1776)

Walden by Henry David Thoreau (1854)

"Society and Solitude" by Ralph Waldo Emerson (1857)

"The Fallacy of Success" by G.K. Chesterton (1909)

The American Language by H.L. Mencken (1938)

"Politics and the English Language" by George Orwell (1946)

"Abraham Lincoln and the Self-Made Myth" by Richard Hofstadter (1948)

"Letter from Birmingham City Jail" by Martin Luther King, Jr. (1963)

"Mother Tongue" by Amy Tan (1990)

"Take the Tortillas Out of Your Poetry" by Rudolfo Anaya (1995)

The Common Core K–12 Mathematics Standards

This document provides grade level standards for mathematics in grades K–8, and high school standards organized under the headings of the *College and Career Readiness Standards in Mathematics*. Students reaching the readiness level described in that document (adjusted in response to feedback) will be prepared for non-remedial college mathematics courses and for training programs for career-level jobs. Recognizing that most students and parents have higher aspirations, and that ready for college is not the same as ready for mathematics-intensive majors and careers, we have included in this document standards going beyond the readiness level. Most students will cover these additional standards. Students who want the option of entering STEM fields will reach the readiness level by grade 10 or 11 and take precalculus or calculus before graduating from high school. Other students will go beyond readiness through statistics to college. Other pathways can be designed and available as long as they include the readiness level. The final draft of the K–12 standards will indicate which concepts and skills are needed to reach the readiness level and which go beyond. We welcome feedback from states on where that line should be drawn.

English Language Learners in Mathematics Classrooms

English language learners (ELLs) must be held to the same high standards expected of students who are already proficient in English. However, because these students are acquiring English language proficiency and content area knowledge concurrently, some students will require additional time and all will require appropriate instructional support and aligned assessments.

ELLs are a heterogeneous group with differences in ethnic background, first language, socio-economic status, quality of prior schooling, and levels of English language proficiency. Effectively educating these students requires adjusting instruction and assessment in ways that consider these factors. For example ELLs who are literate in a first language that shares cognates with English can apply first-language vocabulary knowledge when reading in English; likewise ELLs with high levels of schooling can bring to bear conceptual knowledge developed in their first language when reading in a second language. On the other hand, ELLs with limited or interrupted schooling will need to acquire background knowledge prerequisite to educational tasks at hand. As they become acculturated to US schools, ELLs who are newcomers will need sufficiently scaffolded instruction and assessments to make sense of content delivered in a second language and display this content knowledge.

While some ELLs are economically and educationally advantaged, this is not the case for many of these students. Moreover, once in the U.S., the majority of ELLs attend high poverty schools with high percentages of other ELLs. These schools often lack the resources and capacity needed to help ELLs reach high academic standards. However, schools and districts can be assisted in providing a positive learning environment that capitalizes on the linguistic and cultural diversity of the student body.

Language proficiency is a complex construct that can reflect proficiency in multiple contexts, modes, and academic disciplines. Current measures of language proficiency may not give an accurate picture of an individual's language competence. In particular, we do not have measures or assessments for language proficiency related to competence in mathematics for different ages or mathematical topics. These two facts can confuse discussions of mathematics instruction for ELLs. In particular, because of the complexity of language proficiency and the limitations of the label "English Language Learner" as currently implemented, instructional decisions should not be made solely based on that label. However, research on language and mathematics education for this student population does provide a few clear results to guide practices for teaching ELLs mathematics:

- English learners can participate in mathematical discussions as they learn English (Moschkovich, 1999a, 2002, 2007a, 2007b, 2007d).

- Mathematics instruction for students who are learning English should draw on multiple resources and modes available in classrooms—such as objects, drawings, inscriptions, and gestures—as well as home languages and mathematical experiences outside of school.

- While mathematics instruction for ELLs should address mathematical discourse and academic language, this involves much more than vocabulary instruction.

Basic principles for improving the mathematics achievement of ELLs

Language is a resource for learning mathematics, it is not only a tool for communicating, but also a tool for thinking and reasoning mathematically. All languages (English, Spanish, Tagalog,etc.) and language varieties (different dialects, home or everyday ways of talking, vernacular, slang, etc.) provide resources for mathematical thinking, reasoning, and communicating.

Regular and active participation in the classroom—not only reading and listening but also discussing, explaining, writing, representing, and presenting—is crucial to ELLs' success in mathematics, and that ELLS can produce explanations, presentations, etc. and participate in classroom discussions *as they are learning English* (Moschkovich, 1999 and 2007).

- ELLs, like English-speaking students, require regular access to teaching practices that are most effective for improving student achievement. These practices include: a) Keeping mathematical tasks at high-cognitive demand (Henningsen & Stein, 1997; Silver & Stein, 1996); b) teachers and students attend explicitly to concepts (Hiebert & Grouws, 2007), and c) students wrestle with important mathematics (Hiebert & Grouws, 2007).
- See the evidence of ELLs' mathematical thinking, hear how ELLs use language to communicate about mathematics, understand the competence that ELLS bring to the classroom, build on this competence, and provide access to opportunities for advancing their mathematics learning.

Overall, research suggests that:

- Classroom instruction should allow bilingual students to choose the language they prefer for arithmetic computation. Language switching can be swift, highly automatic, and facilitate rather than inhibit solving word problems in the second language, as long as the student's language proficiency is sufficient for understanding the text of the word problem.
- Instruction should ensure that students understand the text of word problems before they attempt to solve them.
- Instruction should include a focus on "mathematical discourse" and "academic language" because these are important for English learners. Although it is crucial that students who are learning English have opportunities to communicate mathematically, this is not primarily a matter of learning vocabulary. Students learn to participate in mathematical reasoning, not by learning vocabulary, but by making conjectures, presenting explanations, and/or constructing arguments.
- While vocabulary instruction is important, it is not sufficient for supporting mathematical communication. Furthermore, vocabulary drill and practice are not the most effective instructional practices for learning vocabulary. Instead, research has demonstrated that vocabulary learning occurs most successfully through instructional environments that are language-rich, actively involve students in using language, require that students both understand spoken or written words and also express that understanding orally and in writing, and require students to use words in multiple ways over extended periods of time (Blachowicz, Camille, and Peter Fisher, 2000). To develop written and oral communication skills, students need to participate in negotiating meaning for mathematical situations and in mathematical practices that require output from students (Moschkovich, 2009).

References

Blachowicz, Camille, and Peter Fisher. "Vocabulary Instruction." In *Handbook of Reading Research*, Volume III, edited by Michael Kamil, Peter Mosenthal, P. David Pearson, and Rebecca Barr, pp. 503-523. Mahwah, NJ: Lawrence Erlbaum Associates, 2000.

Gándara, Patricia, and Frances Contreras. *The Latino Education Crisis: The Consequences of Failed Social Policies.* Cambridge, Ma: Harvard University Press, 2009.

Moschkovich, Judit N. "Supporting the Participation of English Language Learners in Mathematical Discussions." *For the Learning of Mathematics* 19 (March 1999): 11-19.

Moschkovich, J. N. (in press). Language, culture, and equity in secondary mathematics classrooms. To appear in F. Lester & J. Lobato (Ed.), Teaching and Learning Mathematics: Translating Research to the Secondary Classroom, Reston, VA: NCTM.

Moschkovich, Judit N. "Examining Mathematical Discourse Practices," *For the Learning of Mathematics* 27 (March 2007): 24-30.

Moschkovich, Judit N. "Using Two Languages when Learning Mathematics: How Can Research Help Us Understand Mathematics Learners Who Use Two Languages?" *Research Brief and Clip*, National Council of Teachers of Mathematics, 2009 http://www.nctm.org/uploadedFiles/Research_News_and_Advocacy/Research/Clips_and_Briefs/Research_brief_12_Using_2.pdf. (accessed November 25, 2009).

Moschkovich, J.N. (2007) Bilingual Mathematics Learners: How views of language, bilingual learners, and mathematical communication impact instruction. In N. Nasir and P. Cobb (Eds.), *Diversity, Equity, and Access to Mathematical Ideas*. New York: Teachers College Press, 89-104.

Schleppegrell, M.J. (2007). The linguistic challenges of mathematics teaching and learning: A research review. *Reading & Writing Quarterly*, 23:139-159.

Access for Students with Disabilities

The Common Core Standards articulate rigorous expectations in the areas of mathematics, reading, writing, and speaking and listening in order to prepare students to be college- and career-ready. These standards identify the knowledge and skills students must acquire in order to be successful. Research shows that students with disabilities are capable of high levels of learning and should not be limited by low expectations and watered down curriculum. It is imperative that these highly capable students—regardless of their disability—are held to the same expectations articulated in the Core Standards as other students.[1]

However, *how* these high standards are taught is of the utmost importance in reaching students with special needs. When learning the knowledge and skills represented in the Core Standards, students with disabilities may need accommodations or—in exceptional cases—modified goals, incorporated in an individualized education program (IEP),[2] to help them access information or demonstrate their knowledge. Students might be precluded from reaching particular standards given the nature of the standard itself. In instances when a standard asks students to perform actions they are physically incapable of, students will need to be presented with alternative options to demonstrate similar knowledge and skills within the range of their abilities. Accommodations based on individual needs allow students of all disability levels to learn within the framework of the Core.

Meeting English Language Arts (ELA) Standards

Reading, writing, speaking, and listening standards often require accommodations for students with disabilities. In the case of students who are deaf, a standard that calls for "listening" should be interpreted to include reading sign language. In a similar vein, "speaking" as it occurs in standards for certain students with speech impairments should be read broadly to include "communication" or "self-expression." Students who are blind or have low vision should be able to read via Braille, screen reader technology, or other assistive technology to demonstrate their comprehension

[1] Research suggests that the vast majority of the population of students with intellectual impairments *can* achieve proficiency when they receive high quality instruction in the grade-level content and appropriate accommodations.
[2] According to the Individuals with Disabilities Act (IDEA), an IEP includes appropriate accommodations that are necessary to measure the individual achievement and functional performance of a child.

skills. "Writing" should not preclude the use of a scribe, computer, or speech-to-text technology for students with disabilities that interfere with putting pen to paper. In the case of students with intellectual impairments—less than 2 percent of the total population of all students and less than 20 percent of students with disabilities—accommodations should allow them to demonstrate their knowledge and skills through alternative modes like text to speech software or reading aloud. For these students, writing may involve the use of pictures to assist in illustrating plot or argument, or offering them the opportunity to "choose words and phrases" by selecting from options rather than generating direct answers. With appropriate accommodations and support, students with all levels of disabilities can participate in the general education curriculum and achieve grade-level proficiency with regard to the ELA content and skills articulated in the Core.

Meeting Mathematics Standards

In curriculum for students with disabilities, ELA skills often take precedence over mathematics understanding. However, most of these students can master mathematical concepts with accommodations in instructional delivery and the use of specialized technology, including computers and calculators. For example, students with visual disabilities might require enhanced verbal descriptions from teachers and the use of large-print to demonstrate subsequent knowledge. Students who are deaf might require visual aids such as charts, diagrams, and mental images and increased reliance on computers and calculators. Manipulatives can enable students with intellectual impairments to grasp abstract concepts and continue learning. Evidence suggests that students with disabilities, even those with full intellectual abilities, tend to lag behind their peers in mathematics achievement; strong curriculum that gives equal priority to mathematics and ELA will help these students succeed.

In short, while the standards remain and retain high expectations of students, they may need to be translated and occasionally modified to appropriately apply to students with disabilities, including all levels of intellectual impairment. Every student deserves to be treated with respect, and every student deserves an outstanding education. Promoting a culture of high expectations for all students is a fundamental goal of the Core Standards. Reaching students with disabilities requires broadening our understanding of what the standards say and being ready to make appropriate accommodations and/or modifications to meet individual students' needs.

How to read this document

The K–8 standards are organized by grade level. Within each grade level there are several headings, each one the title of a single progression having significant presence in the grade in question. Under each of these progression headings, there appear **core standards**, divided into standards describing concepts students should understand and standards describing skills students should acquire. A typical progression spans a number of grades, but does not span all of K-8. The progressions and their grade spans are listed at the end of the document.

The high school standards are not organized by grade level or by course, but rather are organized under headings of the *College and Career Ready Standards for Mathematics*: Expressions, Equations, Functions, Coordinates, Modeling, Statistics, Probability, and Geometry.[3] Subheadings under each heading refer either to mathematical practices or to principle topics, and core standards are listed under each subheading, as in the K-8 standards. The subheadings are not necessarily curricular units, but rather can describe concepts and skills that are revisited throughout a student's high school career. This design necessitates a future effort to develop course sequences (either traditional or integrated).

[3] Number and Quantity are not included, since they are principally the domain of K-8. In response to feedback, the headings have been reordered and Shape has been renamed to Geometry.

Mathematical Practice[4]

Proficient students expect mathematics to make sense. They take an active stance in solving mathematical problems. When faced with a non-routine problem, they have the courage to plunge in and try something, and they have the procedural and conceptual tools to carry through. They are experimenters and inventors, and can adapt known strategies to new problems. They think strategically.

Students who engage in these practices discover ideas and gain insights that spur them to pursue mathematics beyond the classroom walls. They learn that effort counts in mathematical achievement.[a] These are practices that expert mathematical thinkers encourage in apprentices. Encouraging these practices in our students should be as much a goal of the mathematics curriculum as is teaching specific content topics and procedures.[b] Taken together with the Standards for Mathematical Content, they support productive entry into college courses or career pathways.

Core Standards · Students can and do:

1 Attend to precision.

Mathematically proficient students organize their own ideas in a way that can be communicated precisely to others, and they analyze and evaluate others' mathematical thinking and strategies noting the assumptions made. They clarify definitions. They state the meaning of the symbols they choose, are careful about specifying units of measure and labeling axes, and express their answers with an appropriate degree of precision. Rather than saying, "let v be speed and let t be time," they would say "let v be the speed in meters per second and let t be the elapsed time in seconds from a given starting time." They recognize that when someone says the population of the United States in June 2008 was 304,059,724, the last few digits indicate unwarranted precision.

2 Construct viable arguments.

Mathematically proficient students understand and use stated assumptions, definitions and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They break things down into cases and can recognize and use counterexamples. They use logic to justify their conclusions, communicate them to others and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose.

3 Make sense of complex problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They consider analogous problems, try special cases and work on simpler forms. They evaluate their progress and change course if necessary. They try putting algebraic expressions into different forms or try changing the viewing window on their calculator to get the information they need. They look for correspondences between equations, verbal descriptions, tables, and graphs. They draw diagrams of relationships, graph data, search for regularity and trends, and construct mathematical models. They check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?"

4 Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern. For example, in $x^2 + 5x + 6$ they can see the 5 as $2 + 3$ and the 6 as 2×3. They recognize the significance of an existing line in a geometric figure and can add an auxiliary line to make the solution of a problem clear. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects. For example, by seeing $5 - 3(x - y)^2$ as 5 minus a positive number times a square, they see that it cannot be more than 5 for any real numbers x and y.[b]

[4] Slated for review and editing, based on feedback to the College and Career Readiness Standards, and in order to apply more naturally to elementary school as well.

5 Look for and express regularity in repeated reasoning.

Mathematically proficient students pay attention to repeated calculations as they carry them out, and look both for general algorithms and for shortcuts. For example, by paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, they might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel in the expansions of $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ leads to the general formula for the sum of a geometric series. As they work through the solution to a problem, proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.[b]

6 Reason quantitatively.

Quantitative reasoning is a way of thinking by which one reasons with quantities and about relations among quantities. It entails habits of creating a coherent image of the problem at hand; considering the units involved; continually attending to the meaning of quantities, not just how to compute them; and having multiple images of a concept and being flexible in transitioning among them. In problems dealing with quantitative relationships, students exercise two inseparable abilities: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referential meanings for the symbols involved in the manipulation.

7 Make strategic decisions about the use of technological tools.

Mathematically proficient students consider the available tools when solving a mathematical problem, whether pencil and paper, ruler, protractor, graphing calculator, spreadsheet, computer algebra system, statistical package, or dynamic geometry software. They are familiar enough with all of these tools to make sound decisions about when each might be helpful. They use mathematical understanding and estimation strategically, attending to levels of precision, to ensure appropriate levels of approximation and to detect possible errors. They are able to use these tools to explore and deepen their understanding of concepts.

Mathematics: Kindergarten[5]

Developing Coherent Understanding

[Temporarily removed for editing.]

Counting and Cardinality

Core Standards · Students understand that:

1. The number words have a standard order.
2. In counting, each object receives one and only one number word.
3. The last number word tells the number of objects.
4. Numbers said later in the count refer to larger quantities.
5. Counting on 1 more is the same as adding 1. That is, one more than a number is the next number in the count.

Core Standards · Students can and do:

a. Count by ones from 1 to 100; count by tens to 100.[6]
b. Count forward from a given number within the known sequence (instead of always counting forward from 1).[7]
c. See collections of up to 10 objects as being composed of subgroups.
d. Count to answer "how many?" questions with up to 10 things in various arrangements (e.g., array, circular, scattered), or up to 25 things if in a row.
e. Write numerals from 1 to at least 30.

Base Ten Computation

Core Standards · Students understand that:

1. Ten ones make a tens unit (ten things can be thought of as bundled into a single unit).
2. Decade words refer to groups of tens units. For example, thirty refers to a group of three tens units.
3. A teen number[8] is a ten and some ones. The number 10 can be thought of as a ten and no ones.
4. Any teen number is larger than any single digit number. Teen numbers are ordered according to their ones digits.
5. A two-digit number is some tens and some ones. For example, 29 is two tens and nine ones.

Core Standards · Students can and do:

a. Make 10 with each number from 1 to 9 (i.e., know the number that makes 10 with the given number).
b. Show each teen number as a ten and some ones.

Early Relations and Operations

Core Standards · Students understand that:

[5] Some material is used verbatim from National Research Council. (2009). *Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity*. Committee on Early Childhood Mathematics, Christopher T. Cross, Taniesha A. Woods, and Heidi Schweingruber, Editors. Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.
[6] To "count" here means only to say the number words, not to determine how many objects are in a collection.
[7] To "count" here means only to say the number words, not to determine how many objects are in a collection.
[8] Glossary: Teen number. A whole number that is greater than or equal to 11 and less than or equal to 19.

1. Adding is putting two groups together or putting some more with a group, and subtracting is taking some from a group.
2. Addition and subtraction can be represented with physical or mental objects (including fingers), pictures, drawings, sounds (e.g. number words), motions, or equations.
3. Adding can be recorded by an expression, as when "three more than six" is recorded as $6 + 3$, or by an equation that also shows the answer ($6 + 3 = 9$). Likewise, subtracting can be recorded by an expression, as when "how much more than 9 is 5" is recorded as $9 - 5$, or by an equation that also shows the answer ($9 - 5 = 4$).
4. Breaking apart a group can be recorded in an equation such as $8 = 5 + 3$. Breaking apart a group in more than one way can be recorded in an equation such as $7 + 6 = 10 + 3$.
5. In all equations, the equals sign indicates that the values on either side are the same.

Core Standards · Students can and do:

a. Use matching and counting strategies to decide whether one set is more than, less than, or equal to another set in number of objects (less than or equal to 10).
b. Compare and order numbers less than or equal to 10.
c. Use concrete objects to determine the answer to addition and subtraction word problems and additions and subtractions with totals less than or equal to 10.
d. Experience enough problem situations so that additions to five and the corresponding subtractions and some additions and subtractions within ten become well known.

Quantity and Measurement

Core Standards · Students understand that:

1. Things have attributes—such as length, weight, capacity, loudness, softness, and so on. A single thing might have several attributes of interest (as when we focus on a child's height and gender).

Core Standards · Students can and do:

a. Directly compare two objects to see which one has "more of" a shared attribute.
b. Rank three objects by a shared attribute (especially length), and use transitivity[9] to compare two objects indirectly.
c. ⬧ Classify objects or people into predetermined categories, and count the numbers in each category. List the categories and counts in order by count. (Each category count less than or equal to 10.)[10]

Shapes

Core Standards · Students understand that:

1. Names refer to shapes regardless of orientation or overall size.[11]

Core Standards · Students can and do:

a. Study a range of 2D and 3D shapes, in different sizes and orientations, and discuss their properties, similarities, and differences using informal language.

[9] Glossary: Transitive property of measurement order: If one object is bigger than a second, and the second object is bigger than a third object, then the first object is bigger than the third object.
[10] The symbol ⬧ indicates material in data analysis and statistics that appears under another progression heading in order to make an important connection.
[11] For example, a square rotated to form a "diamond" is still a square, even though it is rotated. Students at this grade might need to physically rotate a shape until it is "level" before they can correctly name it.

b. Move shapes using translations, reflections and rotations.[12]

[12] This is not meant to be assessed by showing students a picture of a shape and asking them to draw or select a translated, reflected or rotated version of it.

Mathematics: First Grade[13]

Developing Coherent Understanding

[Temporarily removed for editing.]

Early Relations and Operations

Core Standards · Students understand that:

1. Counting on is an efficient method of counting all, in which the initial count of the first addend is omitted.
2. Addition and subtraction apply to situations of joining, separating, part-part-whole, and comparing quantities to one another.[14] These situations can be represented by addition and subtraction equations such as $7 + 5 = 12$, $10 = 5 + 5$, and so on.
3. Addition and subtraction are inverse operations; that is $10 - 8$ can be found by thinking $8 + 2 = 10$.
4. When any two of the numbers in an addition or subtraction equation are known, the unknown number can be found.
5. One-to-one dealing of objects in a collection (e.g., "One for you, one for me, one for him, …") creates fair shares.

Core Standards · Students can and do:

a. Use counting on strategies or decomposing strategies for additions and subtractions within 20.
b. Solve addition problems containing three addends.
c. Use objects, pictures and story contexts to explain what happens when the order of addends in a sum is changed, when 0 is added to a number, and when one addend in a sum is increased by 1 and another decreased by 1.
d. Experience enough problem situations so that many or all sums and differences within 20 become well known.
e. Use drawings and equations to represent and solve word problems involving addition and subtraction.[15]
f. ♦ Organize, represent and interpret data with several categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another
g. Create n fair shares from a collection of objects. Identify the size of one share, and recognize the original collection as n copies of a single share.

Quantity and Measurement

Core Standards · Students understand that:

1. Lengths can be added by placing long objects, rods, or unit cubes end to end in a straight line. The total length is the same in whatever order the rods are placed.

[13] Some material is used verbatim from National Research Council. (2009, op. cit.)
[14] In join and separate problems, there is change over time. In part-part-whole problems, two quantities make up a whole in a static situation. Compare problems involve two quantities and the difference between them. Compare problems add specificity to the notions of greater than and less than.
[15] Include join, separate, part-part-whole, and compare problems, with unknowns in all positions. Represent these situations with equations that use a small square or a ? for the unknown.

2. Lengths can be compared by placing rods side by side, with one end lined up. The difference in length is how far the longer extends beyond the end of the shorter.
3. Lengths are measured (assigned numerical values) by comparing them to other lengths—that is, by using another object as a length unit. The length of an object can be expressed numerically by counting the number of length units that span it with no gaps or overlaps.
4. When an object or figure is decomposed into several pieces, the length of the whole can be found by placing the pieces end to end in any order.
5. A sum of two whole numbers represents a total length; a difference of two whole numbers represents a difference in length.
6. Durations of time are measured by comparing them to other durations of time, such as the earth's rotation period, or the time a minute hand takes to complete a circle around a clock face.

Core Standards · Students can and do:

a. Using an object as a length unit, measure, compare and estimate length.[16]
b. Using an object as a length unit, determine total length by adding lengths of two parts.[17] Compare lengths using addition and subtraction.
c. Decompose circles and rectangles into 2 and 4 equal parts. Describe the parts using the words "halves" and "quarters," and using the phrases "half of" and "quarter of." Describe the wholes as twice or four times as large as the parts.
d. Tell time in hours from clocks; subtract to find whole-hour durations on a clock (within AM or within PM).

Base Ten Computation

Core Standards · Students understand that:

1. In comparing two-digit numbers, the number with more tens units is larger; if the number of tens units is the same in each, the number of ones units decides.
2. In adding or subtracting 2-digit numbers, one adds or subtract like units (tens units and tens units, or ones units and ones units).

Core Standards · Students can and do:

a. Count to 100 or beyond, switching appropriately to the new decade after a 9 has been said in the ones place.
b. Compare and order numbers to 100 based on meanings of the tens and ones places.
c. Easily write numerals to 20; write numerals to 100.
d. Use break-apart and make-a-ten strategies to add and subtract with teen totals as in $7 + 6 = 10 + 3$ and $17 - 9 = 17 - 7 - 2$.
e. Find 10 more or 10 less than a number without having to count.
f. Add one-digit numbers to two-digit numbers, and add multiples of 10 to one-digit and two-digit numbers.
g. Represent addition of two-digit numbers using 10-rods and unit cubes,[18] including rearranging rods and cubes to show regrouping when needed.
h. Add two-digit numbers to two-digit numbers using strategies based on place value, Properties of Arithmetic, or the inverse relationship between addition and subtraction.

Shapes

[16] Select and iterate units, partition into equal parts, and compare lengths indirectly by using a reference length.
[17] Restrict to whole-unit lengths.
[18] Any concrete model that can show individual units and ten connected units will do.

Core Standards · Students understand that:

1. Several shapes can be joined together to form a larger shape. A single shape can also be visualized as a collection of smaller shapes joined together.
2. Decomposing larger shapes into equal-sized parts creates fair shares.
3. When an identical figure is decomposed into more fair shares, the shares are smaller than in the first instance.

Core Standards · Students can and do:

a. Form different 2D figures with cutouts of rectangles, squares, triangles, semicircles, and quarter-circles.[19]
b. Form different 3D figures with concrete models of cubes, rectangular prisms, cones, and cylinders.[20]
c. Decompose 2D shapes into rectangles, squares, triangles, semicircles, and quarter-circles, including decomposing into fair shares.

[19] From Singapore Primary 2
[20] From Singapore Primary 2

Mathematics: Second Grade

Developing Coherent Understanding

[Temporarily removed for editing.]

Operations and the Problems They Solve

Core Standards · Students understand that:

1. Addition and subtraction apply to situations of joining, separating, part-part-whole, and comparing quantities to one another.[21] These situations can be represented by addition and subtraction equations such as $17 + 5 = 22$, $36 = 56 - 26$, and so on.
2. Addition and subtraction are inverse operations; that is $100 - 98$ can be found by thinking $98 + 2 = 100$.
3. Numbers can be added and subtracted only when they refer to the same underlying unit.

Core Standards · Students can and do:

a. Use representations (objects, pictures, story contexts) to describe and justify properties of addition and subtraction.[22]
b. Produce full sets of related equations for addition and subtraction, as in the set $5 + 3 = 8$, $3 + 5 = 8$, $8 = 5 + 3$, $8 = 3 + 5$, $8 - 5 = 3$, $8 - 3 = 5$, $3 = 8 - 5$, $5 = 8 - 3$.
c. Solve up to two-step addition/subtraction word problems with whole numbers and whole number quantities within 100.[23]

Base Ten Computation

Core Standards · Students understand that:

1. A three-digit number is made up of hundreds, tens and ones units. Digits in each place are worth ten times as much as digits in the place to the right.
2. Comparison of numbers is decided by the leftmost digit, with subsequent digits breaking ties.
3. Three-digit numbers can be expanded into sums of hundreds, tens and ones units. In adding or subtracting, one adds or subtracts the units of each size; regrouping might be needed to write a total in standard form if there are too many of a unit, or to get enough of a unit to subtract from it.
4. The scheme for regrouping is the same at each place, because each unit is composed of ten of the smaller unit.

Core Standards · Students can and do:

a. Compare and order numbers to 1,000.

[21] In join and separate problems, there is change over time. In part-part-whole problems, two quantities make up a whole in a static situation. Compare problems involve two quantities and the difference between them. Compare problems add specificity to the notions of greater than and less than.

[22] Include properties such as that the sum is the same when multiple addends are added in a different order; if adding two numbers gives a certain sum, then subtracting one of the addends from the sum results in the other addend; that if more is subtracted from a number, the difference is decreased and if less is subtracted the difference is increased; that in an addition problem, each addend can be taken apart and the parts can be recombined in any order without changing the sum.

[23] Include join, separate, part-part-whole, and compare problems, with unknowns in all positions. Represent these situations with equations that use a small square or a ? for the unknown.

b. Given a three-digit number, quickly find 10 more or 10 less than the number, and quickly find 100 more or 100 less than the number.
c. Rapidly add and subtract within 20.[24]
d. Add and subtract three-digit numbers to three-digit numbers using strategies based on place value, Properties of Arithmetic, or the inverse relationship between addition and subtraction.
e. Add and subtract three-digit numbers using an algorithm[25] based on place value and regrouping, such as the standard algorithm.
f. Explain why addition and subtraction strategies and algorithms work, using place value and the Properties of Arithmetic (including explanations supported by drawings or objects).

Quantity and Measurement

Core Standards · Students understand that:

1. 1 inch, 1 foot, 1 centimeter and 1 meter are conventionally defined lengths that allow standardized length measurements.
2. When measuring a length, if a smaller unit is chosen, more units must be iterated to measure the length in those units. But the length of an object itself does not depend on the choice of unit.
3. Units can be decomposed into smaller units, e.g. a foot contains 12 inches and a meter contains 100 centimeters. A small number of long units might form a greater total length than a large number of small units.
4. Sharing a circle or rectangle fairly among 2-6 shares creates equal parts, each of which is a single unit. Copying one unit by the number of pieces measures the whole in terms of the units.
5. A half, a third, or a quarter of a given rectangle encloses the same amount of space regardless of its shape.

Core Standards · Students can and do:

a. Measure, compare and estimate whole-unit lengths in units of inches, feet centimeters and meters.
b. Construct a number line with an origin (0) and a unit (1), marking off whole numbers one unit distance apart. Use a number line to represent sums and differences; determine lengths of intervals on the number line.
c. Decompose circles and rectangles into 2-6 equal parts. Describe the parts using the words "halves," "thirds," "half of," "a third of," etc. Describe the wholes as 2-6 times as large as the parts.
d. Construct a number line to 100 using tens-unit lengths, showing ones-unit lengths within a decade of interest. Explain regrouping by composing and decomposing concrete lengths.
e. ♦ Draw a bar graph (with single-unit scale) to represent a data set with several categories. Solve simple part-part-whole and compare problems using information presented in a bar graph.[26]
f. ♦ Identify correspondences in different representations of a data set with several categories.
g. Solve word problems involving dollar bills, quarters, dimes, nickels and pennies.

Shapes

Core Standards · Students understand that:

[24] Acceptable strategies include: mental strategies such as making a ten, use of fingers to assist in rapid counting-on, and producing sums or differences from memory.

[25] Glossary: Algorithm. A step by step routine that always gives some answer, rather than ever giving no answer; that always gives the right answer, and never gives a wrong answer; that can always be completed in a finite number of steps, rather than in an infinite number of steps; and that applies to all problems of a given type (e.g., adding any two multidigit whole numbers, or bisecting any angle). Cf. Wikipedia's "effective procedure," from which this definition is adapted.

[26] For part-part-whole problems, only sum-unknown problems are required to meet this standard. For compare problems, only difference-unknown problems are required to meet the standard.

1. A given category of shapes (e.g., triangles) can be divided into subcategories (e.g., isosceles triangles) on the basis of special properties. Conversely, different classes of shapes (e.g., squares and rectangles) can be united into a larger category (e.g., quadrilaterals) on the basis of shared properties.

Core Standards · Students can and do:

a. Draw and identify equilateral triangles, isosceles triangles,[27] squares and rectangles.[28]
b. Recognize squares and rectangles as examples of quadrilaterals; draw examples of quadrilaterals that are neither squares nor rectangles.
c. Draw and identify radii and diameters of a circle.
d. Recognize objects that resemble spheres, cylinders and rectangular prisms.

[27] Students at this grade need not understand that equilateral triangles are isosceles.
[28] Students at this grade need not understand that squares are rectangles.

Mathematics: Third Grade

Developing Coherent Understanding

[Temporarily removed for editing.]

Operations and the Problems They Solve

Core Standards · Students understand that:

1. Multiplication and division apply to situations of equal grouping, fair sharing, measuring, and comparing ("times as much").
   - An equation of the form $a \times b = n$ applies to a situation in which a groups of b things each make n things in all, or in which a copies of a continuous quantity of size b form a continuous quantity of size n. (See table for examples.)
   - An equation of the form $n \div a = b$ tells how many things, b, are in each group when n things are divided equally into a groups, or tells how large a quantity b results when a continuous quantity of size n is shared fairly into a shares. (See table for examples.)
   - An equation of the form $n \div b = a$ tells how many groups, a, result when n things are divided into equal groups of b things each, or tells how many fair shares, a, a quantity of size n yields when each share has size b. (See table for examples.)
   - Two quantities can be compared by multiplication or division. An equation of the form $a \times b = n$ means n is a times as much as b and b times as much as a.
2. Multiplication is commutative: The total number of things in a groups of b things each is the same as the total number of things in b groups of a things each, that is, $a \times b = b \times a$. Likewise, a copies of a continuous quantity of size b are equal in size to b copies of a continuous quantity of size a.
3. The area of a rectangle with whole number side lengths can be calculated by multiplying because the rectangle can be decomposed into equal rows (or columns) of unit squares.
4. Multiplication and division are inverse operations; that is $35 \div 7$ can be found by thinking $5 \times 7 = 35$. When any two of the numbers in a multiplication or division equation are known, the unknown number can be found.

	$3 \times 6 = 18$	$18 \div 3 = 6$	$18 \div 6 = 3$
Collections	3 rows of apples with 6 apples in each row are 18 apples.	If 18 apples are arranged into 3 equal rows, each row will have 6 apples in it.	If 18 apples are arranged into equal rows of 3 apples, there will be 6 rows.
Continuous Quantities	If you have enough ribbon to make 6 bows, then 3 times as much ribbon will make 18 bows.	If you have enough ribbon to make 18 bows and share the ribbon fairly among 3 kids, then each kid has enough ribbon to make 6 bows.	If each kid wants to make 6 bows and there's enough ribbon to make 18 bows, then 3 kids can make bows.

Core Standards · Students can and do:

a. Use representations (objects, pictures, story contexts) to describe and justify properties of multiplication and division.[29]
b. Solve simple multiplication and division word problems involving equal groups, length and area.
c. Solve up to two-step word problems involving the four operations with whole numbers and whole number quantities. (Whole number quotients only)
d. Solve multiplicative comparison problems with whole numbers (problems involving the notion of "times as much").
e. ♦ Draw a scaled bar graph to represent a data set with several categories. Solve "how many more"/"how many less" problems (two-step problems) using information presented in scaled bar graphs.[30]

Base Ten Computation

Core Standards · Students understand that:

1. Patterns in the multiplication table can be explained by the Properties of Arithmetic. For example, the distributive property explains why, for any row, the entries in the 7 column are the sums of the entries in the 5 and 2 columns.
2. The Properties of Arithmetic can be used to derive new multiplications and divisions from known ones.

Core Standards · Students can and do:

a. Explain strategies for multiplying and dividing that use the Properties of Arithmetic and properties of the base ten system.
b. Rapidly multiply and divide within 100.[31]
c. Produce full sets of fact families for multiplication and division, as in the set $6 \times 7 = 42$, $7 \times 6 = 42$, $42 = 7 \times 6$, $42 = 6 \times 7$, $42 \div 7 = 6$, $42 \div 6 = 7$, $6 = 42 \div 7$, $7 = 42 \div 6$.
d. Find the factor pairs for a given number, as in the factor pairs for the number 42: {42, 1}, {21, 2}, {14, 3}, {7, 6}.

Fractions

Core Standards · Students understand that:

1. When a whole, 1, is divided into b equal parts, the size of the parts is written $1/b$. To show $1/b$ of something, divide the thing into b equal parts.
2. For a whole number a and a positive whole number b, a/b is defined as a copies of $1/b$.[32] This can be thought of as the sum $1/b + 1/b + \ldots + 1/b$ (with a summands).
3. Whole numbers can be written as fractions, as in $b/b = 1$, $n/1 = n$, and cases such as $(4 \times 7)/4 = 7$.
4. Fractions are numbers and can be seen as lengths on a number line.[33]

[29] Include properties such as that the product is the same when the order of the factors is changed; that multiplication problems involving 1-digit numbers can be solved by breaking one factor apart additively and multiplying each part by the other factor; and that multiplying a quantity by a number, then dividing by the same number, leaves the original quantity unchanged.

[30] Include single-unit scales and multiple-unit scales. For multiple-unit scales, all counts should be evenly divisible by the scale factor. No count should represent more than ten of the scale unit, and no scale unit should represent more than ten counts.
[31] A variety of mental strategies are acceptable, including derived fact strategies and producing products or quotients from memory.
[32] This includes fractions greater than 1. For example, $17/5$ is 17 copies of $1/5$.
[33] For example, $17/5$ is 17 copies of the subinterval $1/5$ laid end to end.

5. Two fractions are equal when they represent the same portion of a whole, or when they have the same length on a number line. One fraction is greater than another when it represents a greater portion of the whole than the other, or lies to the right of the other on the number line.
6. Given two unit fractions, the fraction with the larger denominator is smaller, because dividing a whole into a larger number of parts leads to smaller parts.
7. Fractions with the same denominator can be added or subtracted by adding or subtracting the units indicated by the unit fraction. For example, $2/3 + 4/3$ is 2 copies of $1/3$ plus 4 copies of $1/3$, or 6 copies of $1/3$ in all, that is $6/3$.
8. The decimal 0.1 denotes the fraction $1/10$, 0.2 denotes $2/10$, and so on through 0.9, which denotes $9/10$.

Core Standards · Students can and do:

a. Use fractions to describe quantities and parts of wholes.
b. Compare and order fractions with equal numerators or equal denominators, including in contextual situations, using the fractions themselves, bar strip drawings, number line representations, and area models.
c. Reason about fractions to establish equivalences between fractions with unlike denominators 2, 3, 4 and 6 (e.g. $1/2 = 2/4$, $4/6 = 2/3$).
d. Add and subtract fractions with like denominators.
e. Solve word problems that involve adding, subtracting, ordering and comparing fractions.
f. Represent fractions of the form $a/10$ in decimal notation; compare and order to tenths in decimal notation.

Quantity and Measurement

Core Standards · Students understand that:

1. A unit of measure can be partitioned into equal-sized parts, whose sizes can be represented as fractions of the unit.
2. The area of a closed plane figure is a measure of how much space it encloses. A square with side length 1 unit is said to enclose "one square unit" of area.
3. The area of a closed plane figure can be measured (expressed numerically) by the number of square units that fit inside it with no gaps or overlaps.
4. Area is a model for multiplication because tiling a rectangle with unit squares shows that a rectangle a units long by b units wide encloses an area of $a \times b$ square units.

Core Standards · Students can and do:

a. Measure lengths using rulers marked with halves and fourths of inches. Make a dot plot to show repeated measurements.
b. Convert compound units to a smaller or a larger unit, and solve problems involving mixed units (feet and inches, yards and feet).
c. Using customary units, demonstrate and justify correct processes for measuring, comparing, and estimating length, mass, capacity, and durations of time, including unit selection, partitioning and iterating units, and transitivity.
d. Compute perimeters of polygons by adding given side lengths, and find an unknown length in a polygon given the perimeter and all other side lengths. Represent these problems with equations involving a symbol for the unknown quantity.
e. Determine and compare areas by counting square units (improvised units, cm^2, m^2 in^2, ft^2).
f. Compute elapsed time and solve problems involving elapsed time (to the nearest minute).

Mathematics: Fourth Grade

Developing Coherent Understanding

[Temporarily removed for editing.]

Operations and the Problems They Solve

Core Standards · Students understand that:

1. Quantities in a problem might be described with whole numbers, fractions or decimals; the operations used to solve the problem depend on the relationships between the quantities whatever numbers are involved.
2. The distributive property (of multiplication over addition) relates addition and multiplication. The distributive property can be shown numerically and visually, using arrays and area models.

Core Standards · Students can and do:

a. Solve multistep word problems involving the four operations with whole numbers.[34]
b. Estimate answers to computations and compute mentally to assess reasonableness of results.
c. Solve problems that involve comparing, ordering, adding and subtracting fractions with like denominators. Compare fractions to benchmark fractions.
d. Solve problems that involve comparing and ordering decimal numbers to hundredths. Compare decimals to benchmark decimals.
e. ♦Make a table from given data, ask and answer questions about data in a table, solve multi-step problems using information presented in tables, and find patterns in tables.[35]

Fractions

Core Standards · Students understand that:

1. The fraction a/b can be written as $a \times 1/b$ because a/b is a copies of $1/b$.
2. When a identical things are divided into b equal parts, each of a things contributes $1/b$. So $a \div b = a/b$.[36]
3. A fraction can be multiplied by a whole number as $n \times a/b = n^{\times}a/b$. For example, $3 \times 2/5$ can be seen as 3 groups of 2 unit fractions $1/5$.[37]
4. A decimal of two digits stands for a sum of fractions whose denominators are 10 and 100. For example, 0.34 stands for $3/10 + 4/100$.

Core Standards · Students can and do:

a. Reason about fractions to establish equivalences between related fractions[38] (e.g. $3/10 = 30/100$, $9/12 = 3/4$).

[34] Use the properties of multiplication (commutative, associative, identity) or the inverse relationship between multiplication and division (multiplying a number by b then dividing by b, and vice versa, leaves the number unchanged) to make sense of single digit multiplication and division situations and solve problems.
[35] Include tables with data from proportional relationships.
[36] This definition agrees with previous understandings of division in cases like $28 \div 7$ (i.e., when a is a multiple of b), but also gives meaning to quotients such as $3 \div 4$ or $7 \div 2$.
[37] Using the Properties of Arithmetic, $n \times a/b = n \times (a \times 1/b) = (n \times a) \times 1/b = (n \times a)/b$.

b. Add and subtract related fractions in simple cases within one whole (e.g. $1/2 + 1/4$, $3/10 + 4/100$).
c. Solve word problems posed with whole numbers that have fractional answers.
d. Represent multiplication of whole numbers by fractions and fractions by whole numbers, using length and area models.
e. Solve word problems involving multiplying fractions by whole numbers and multiplying whole numbers by fractions.[39]
f. Use decimals to hundredths to describe quantities and parts of wholes, compare and order decimals to hundredths, and write fractions of the form $a/10$ or $a/100$ in decimal notation.
g. Round decimals (to hundredths) to the nearest whole number.
h. Solve addition and subtraction story problems involving fractions with related denominators (situations familiar from whole number work).

Base Ten Computation

Core Standards · Students understand that:

1. The product of a one-digit number times a multidigit number is the sum of the products of the one-digit number times each place value component. This is an instance of the distributive property.
2. Multi-digit multiplication algorithms can be derived and explained by decomposing numbers into their place value components and applying the distributive property.
3. Digits in each place are worth ten times as much as digits in the place to the right and a tenth as much as digits to the left; comparison of numbers is decided by the leftmost digit, with subsequent digits breaking ties.
4. Given whole numbers a and b, find whole numbers Q and R so that $a = Q \times b + R$. For example, given 325 and 7, express 325 in the form $325 = 46 \times 7 + 3$.

Core Standards · Students can and do:

a. Demonstrate place value understanding for whole numbers to 1,000,000 and compare numbers within this range.
b. Round whole numbers to the nearest 10 or 100 and use rounding to estimate computations.
c. Multiply single place numbers (to 9000) by single digit numbers.[40]
d. Multiply two-, three- and four-digit numbers by single-digit whole numbers, and multiply two-digit numbers by two-digit numbers, using strategies based on place value, Properties of Arithmetic, or the inverse relationship between multiplication and division.
e. Multiply two-digit numbers by two-digit numbers using an algorithm based on place value and regrouping, such as the standard algorithm.
f. Divide two-, three- and four-digit numbers by single-digit numbers, with or without remainder. In the case of remainders, express results in the form of an equation, as in $325 = 46 \times 7 + 3$.
g. Explain why multiplication and division strategies and algorithms work, using place value and the Properties of Arithmetic (including explanations supported by drawings or objects).

Quantity and Measurement

Core Standards · Students understand that:

[38] Glossary: Related fractions. Two fractions are *related* if one denominator is a factor of the other. (See Ginsburg, Leinwand and Decker (2009), *Informing Grades 1-6 Mathematics Standards Development: What Can Be Learned from High-Performing Hong Kong, Korea, and Singapore?*, Table A1, p. A-5, grades 3 and 4.)
[39] Include sharing multiple continuous wholes a fairly among b people, naming an individual share as a/b. For example 5 meters of pink ribbon shared among 3 people results in $5/3$ meters each.
[40] Glossary: Single-place number. The numbers that result when a whole number between 1 and 9 (inclusive) is multiplied by the numbers 10, 100, 1000, etc.

1. Area is additive: If a figure is decomposed into several pieces, then the area of the whole figure can be found by adding the areas of the pieces (expressed in common units).
2. An angle is two rays with a common endpoint, and is measured by the relative amount of a circle that you trace when turning from one ray to the other.
3. A one-degree angle turns through 1/360 of a circle, where the circle is centered at the origin of the rays; the measure of an angle is the number of one-degree angle turned with no gaps or overlaps.

Core Standards · Students can and do:

a. Apply the formula for area of squares and rectangles. Measure and compute whole-square-unit areas of objects and geometric figures decomposable into rectangles.[41]
b. ♦ Make a dot plot to show repeated measurements in common fractions of a unit ($1/2$, $1/4$, $1/8$). Solve problems involving addition and subtraction of fractions by using information presented in dot plots (e.g., finding the difference in length between the longest and shortest specimens in an insect collection).
c. Draw scales (number line representations) of problem situations involving length, height and distance including fractional units or decimal numbers.
d. Find one dimension of a rectangle given the other dimension and its area or perimeter; find the length of one side of a square given its area or perimeter. Represent these problems with equations involving a symbol for the unknown quantity.
e. Measure angles in whole-number degrees using a protractor; sketch angles of specified measure. Find the measure of a missing part of an angle, given the measure of the angle and the measure of a part of it; represent these problems with equations involving a symbol for the unknown quantity.

Shapes

Core Standards · Students understand that:

1. Shapes can be analyzed and classified using concepts of parallelism, perpendicularity and angle measure.

Core Standards · Students can and do:

a. Draw points, lines, line segments, rays and angles; identify these in geometric figures.
b. Associate angles of a quarter turn (subtending ¼ of a circle) with angle measure 90°, a half turn (½ of a circle) with angle measure 180°, ¾ turn (¾ of a circle) with angle measure 270°, and a full turn (complete circle) with angle measure 360°.[42]
c. Draw perpendicular and parallel lines; identify these in geometric figures.
d. Identify right angles and angles smaller than/greater than a right angle in geometric figures; recognize right triangles.
e. Given a quadrilateral, say whether it is a square, whether it is a rectangle, and whether it is a parallelogram (with an understanding that a given shape may fit more than one category).

[41] using one-digit or two-digit numbers times two-digit numbers
[42] From Singapore Primary 4

Mathematics: Fifth Grade

Developing Coherent Understanding

[Temporarily removed for editing.]

Fractions

Core Standards · Students understand that:

1. Fractions a/b and $(n\times a)/(n\times b)$ are equal: for $1/b$ is n copies of $1/(n\times b)$, so a/b is $n \times a$ copies of $1/(n\times b)$. Example: $1/3$ is 4 copies of $1/12$, so $2/3$ is 8 copies of $1/12$; thus $2/3 = 8/12$.
2. Fractions can be added or subtracted by replacing each with an equal fraction so that the resulting fractions have the same denominator. Example: $2/3 + 5/4 = 8/12 + 15/12 = 23/12$.
3. Multiplying unit fractions gives a new unit fraction with denominator equal to the product of the initial denominators. For example, $1/3 \times 1/2 = 1/(3\times2)$. The product $1/3 \times 1/2$ is 1 part when a whole of size $1/2$ is divided into 3 parts, i.e. it is "$1/3$ of $1/2$."[43]
4. Multiplying unit fractions can be extended to multiplying fractions in general. For example, $2/3 \times 4/5$ can be seen as 2 groups of 4 unit fractions $1/15$, hence the product is $8/15$.[44] The product $2/3 \times 4/5$ is 2 parts when a whole of size $4/5$ is divided into 3 parts, i.e. it is "$2/3$ of $4/5$."[45]
5. Dividing a unit fraction $1/b$ by a whole number n gives a unit fraction with denominator $n \times b$, because when $1/b$ is divided into n equal parts, the size of each part is $1/(n\times b)$. For example, $1/3 - 2 = 1/6$.
6. Dividing a whole number n by a unit fraction $1/b$ gives a whole number $n \times b$, because, as there are b units of $1/b$ in 1, there are $n \times b$ units of $1/b$ in n. For example, $2 - 1/3 = 6$.
7. A mixed number stands for the sum of its whole number part and a fractional part less than 1. A mixed number can be written as a fraction greater than 1, such as $17/5$. This equivalence can be shown using area, length, and number line models.
8. The ratio of two whole number quantities a and b, written $a:b$ or a/b, is a multiplicative comparison telling how much of one quantity there is for a given amount of the other, or how many times as much one is than the other.[46]

Core Standards · Students can and do:

a. Use area models and length models (such as strip drawings or the number line) to represent multiplication of fractions, division of unit fractions by whole numbers, and division of whole numbers by unit fractions.
b. Multiply fractions, divide unit fractions by whole numbers, and divide whole numbers by unit fractions, and solve word problems involving these operations.
c. Divide whole numbers by single digit decimals by seeing that they are fractions with denominator 10 or 100.
d. Rename fractions and mixed numbers to equivalent forms and identify equivalent fractions.
e. Compare and order fractions and mixed numbers with like or unlike denominators, including in contextual situations, using the fractions themselves, strip drawings or number line representations, and area models. Describe the size of fractional quantities with reference to the problem situation.
f. Make tables of equal ratios relating whole number quantities, and find missing values in the tables. Plot pairs of values on the coordinate plane. Example

[43] On the number line, $1/a \times 1/d$ is 1 part when the interval from 0 to $1/d$ is divided into n parts. This is the same as 1 part when the interval from 0 to 1 is divided into $n \times d$ parts, and thus $1/a \times 1/d = 1/a\times d$.
[44] Using the Properties of Arithmetic, $2/3 \times 4/5 = (2 \times 1/3) \times (4 \times 1/5) = (2 \times 4) \times (1/3 \times 1/5) = (2 \times 4) \times 1/3\times5 = 2\times4/3\times5$.
[45] On a number line, $m/n \times c/d$ means m parts when the interval from 0 to c/d is divided into n parts.
[46] For example, in a mixture of 5 cups of flour and 2 cups of sugar, the ratio is 5 cups flour to 2 cups sugar. There is $5/2$ times as much flour as sugar (equivalently, 2 $1/2$ times as much or 2.5 times as much).

Cups of Flour	5	10	?	20
Cups of Sugar	2	?	6	8
Flour:Sugar (fraction form)	5/2	10/4	?	20/8
Flour:Sugar (decimal form)	?	?	?	?

Hours of Snowfall	5	10	?	20
Inches of Snow	2	?	6	8
Inches:Hours (fraction form)	2/5	4/10	?	8/20
Inches:Hours (decimal form)	?	?	?	?

Base Ten Computation

Core Standards · Students understand that:

1. The standard division algorithm is based on successively finding the largest single digit multiple of the divisor that is less than the dividend, regrouping to the next lower unit if necessary, and then subtracting the multiple and repeating to find the next digit in the quotient.
2. The division algorithm can be used to express a fraction in decimal form by carrying the division into the decimal places.
3. The features of the place value system for whole numbers extend to the decimal positions and the combined system is symmetric around the ones place.
4. In adding or subtracting decimal numbers, one operates separately with the units of each size, except when regrouping is needed; the scheme for regrouping is the same at each place, because each unit is composed of ten of the next smaller unit.
5. Numbers in decimal notation can be shown on the number line by dividing and sub-dividing the unit intervals as many times as needed to locate the number. This process can be visualized as zooming in on the number line.

Core Standards · Students can and do:

a. Divide two, three and four digit numbers by two digit numbers, with remainder, using an algorithm based on place value and regrouping, such as the standard algorithm. In the case of remainders, express results in the form of an equation, as in $145 = 11 \times 13 + 2$.
b. Understand very large and very small numbers (from millionths to hundreds of millions); round very large numbers.
c. Quickly find 0.1 more than a number and less than a number; 0.01 more than a number and less than a number; and 0.001 more than a number and less than a number.
d. Add and subtract decimals using an algorithm based on place value and regrouping, such as the standard algorithm, and solve problems involving these operations.
e. Write fractions in decimal notation for denominators 2, 3, 4, 5, 6, 8, 10 and 100.
f. Explain why strategies and algorithms for decimals work, using place value and the Properties of Arithmetic (including explanations supported by drawings or objects).

Quantity and Measurement

Core Standards · Students understand that:

1. The volume of a solid figure is a measure of how much space it encloses. A cube with side length 1 unit is said to contain "one cubic unit" of volume. The volume of a solid figure can be measured (expressed numerically) by the number of cubic units that fit inside it with no gaps or overlaps.
2. Packing a rectangular prism with unit cubes and decomposing the prism into layers shows that a rectangular prism ℓ units long by w units wide by h units tall contains a volume $V = \ell \times w \times h$ cubic units. The base of the prism has area $A = \ell \times w$ square units, and the prism can be viewed as h layers, each containing $\ell \times w$ cubic units, so the volume of the prism can also be expressed as $V = A \times h$ cubic units.
3. Volume is additive: If a solid figure is decomposed into several pieces, then the volume of the whole figure can be found by adding the volumes of the pieces (expressed in common units).
4. Quantities with like units can be added or subtracted giving a sum or difference with the same unit; quantities with unlike units can be multiplied or divided giving products or quotients with derived units.
5. The ratio of a length, area or amount to another length, area or amount is the same regardless of the size of the unit used for measurement.
6. The number line is a scale that can be used to show units such as pounds, liters, etc.

Core Standards · Students can and do:

a. Measure and compute whole-cubic-unit volumes for rectangular prisms and for objects well described as rectangular prisms.
b. Convert among different-sized standard measurement units within a given measurement system (e.g. feet to yards, centimeters to meters) and use conversion to solve story problems.
c. Form ratios of lengths, areas, and other quantities, including when quantities being compared are measured in different units.
d. Solve word problems involving addition, subtraction, multiplication and/or division using quantities expressed as whole numbers, fractions, or decimals with measurement units.
e. Solve multi-step problems involving units of weight, capacity, money, volume and area.

Coordinate Geometry

Core Standards · Students understand that:

1. A pair of perpendicular number lines ("axes") defines a coordinate system. A given point in the plane has a separate position along each of the two axes; the two positions of the point are called its coordinates.
2. Graphs on coordinate axes can be used to make sense of relationships among quantities in complex problems.

Core Standards · Students can and do:

a. Graph points in the first quadrant the coordinate plane, and read off the coordinates of graphed points.[47]
b. Determine the lengths of horizontal and vertical segments in the plane, given the coordinates of their endpoints.
c. ✦ Collect data on continuous covarying quantities and display the data in a line graph with broken lines; distinguish bar graphs from line graphs; ask and answer questions from line graphs, including comparisons of ratios.

Statistics

Core Standards · Students understand that:

[47] The axes should sometimes represent dimensioned quantities, and the units of measure should not always be the same for both axes. Coordinates may be whole numbers, fractions or decimals.

1. Data are collected purposefully to answer a predefined question (e.g., "How tall are the fifth graders in our school?")
2. A set of data typically shows variability—not all of the values are the same—and yet the values also typically show some tendency to cluster. Identifying a "center" for a data set is a way to describe its many values using a single number.
3. The median is a measure of center in the sense that approximately half the data values are less than median, while approximately half are greater.
4. Variation in a data set can be measured by the range and by typical deviations from the center.

Core Standards · Students can and do:

a. Collect data to answer a predefined question about a measurement quantity. Make a dot plot to display the data, and describe the data using the median and typical deviations from the it.

Mathematics: Sixth Grade

Developing Coherent Understanding

[Temporarily removed for editing.]

Ratios and Proportional Relationships

Core Standards · Students understand that:

1. Multiplicative comparisons can be extended from whole numbers to fractions and decimals. When the ratio q/m is formed, or when q is r times as much as m, the numbers q, r and m can be fractions or decimals.
2. p% of a quantity means $p/100$ times as much as the quantity. The number p can be a fraction or decimal, as in 3.75%.
3. A unit rate is the multiplicative factor relating the two quantities in a ratio. Two quantities q and m can be compared by $q = r \times m$, where the unit rate r tells how much q per m.
4. Given two quantities in a ratio (e.g. distance and time), finding the unit rate produces a new type of quantity (e.g. speed).

Core Standards · Students can and do:

a. Solve for an unknown quantity in a problem involving two equal ratios.
b. Find a percentage of a quantity; solve problems involving finding the whole given a part and the percentage.
c. Solve unit rate problems including unit pricing and constant speed. (See table.)

$D = s \times T$	$D \div T = s$	$D \div s = T$
A car driving at a speed of 30 miles per hour for 6 hours travels a distance of 180 miles.	If a car drives 180 miles for 6 hours at a constant speed, that speed is 30 miles per hour.	When a car drives 180 miles at a speed of 30 miles per hour, the trip takes 6 hours.

d. Represent unit rate problems on a coordinate plane where each axis represents one of the two quantities involved, and find unit rates from a graph. Explain what a point (x, y) means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.

The Number System

Core Standards · Students understand that:

1. The Properties of Arithmetic govern operations on all numbers.
2. Division of fractions follows the "invert and multiply" rule because multiplication and division are inverse operations. For example, $(2/3) \div (3/7) = 14/15$ because $(14/15) \times (3/7) = 2/3$.
3. Every nonzero fraction has a unique multiplicative inverse,[48] namely its reciprocal. Division can be defined as "multiplying by the multiplicative inverse." Then $(2/3) \div (3/7) = 14/15$ because the division symbol indicates multiplication by the multiplicative inverse.
4. A two-sided number line can be created by reflecting the fractions across zero. Numbers located to the left of zero on the number line are called negative numbers and are labeled with a negative sign.

[48] Glossary: Multiplicative inverses. Two numbers whose product is 1 are multiplicative inverses of one another. Example: $3/4$ and $4/3$ are multiplicative inverses of one another because $3/4 \times 4/3 = 4/3 \times 3/4 = 1$.

5. Two different numbers, such as 7 and −7, that are equidistant from zero are said to be opposites of one another. The opposite of 7 is −7 and the opposite of −7 is 7. The opposite of the opposite of a number is the number itself. The opposite of 0 is 0. The operation of attaching a negative sign to a number can be interpreted as reflecting the number across zero on the number line.
6. The absolute value of a number is its distance from zero on the number line. For any positive number q, there are two numbers whose absolute value is q, namely q and $-q$.
7. The absolute value of a signed quantity (e.g. account balance, elevation) tells the size of the quantity irrespective of its sense (debit or credit; above or below sea level).
8. Comparison of numbers can be extended to the full number system. The statement $p > q$ means that p is located to the right of q on the number line, while $p < q$ means that p is located to the left of q on the number line. The statement $p > q$ does not mean $|p| > |q|$.

Core Standards · Students can and do:

a. Divide fractions, and divide finite decimals by expressing them as fractions.
b. Solve problems requiring arithmetic with fractions presented in various forms, converting between forms as appropriate and estimating to check reasonableness of answers.
c. Find and position rational numbers[49] on the number line.
d. Use rational numbers to describe quantities such as elevation, temperature,[50] account balance and so on. Compare these quantities using > and < symbols and also in terms of absolute value.
e. Graph points and identify coordinates of points on the Cartesian coordinate plane in all four quadrants.

Statistics

Core Standards · Students understand that:

1. The mean is a measure of center in the sense that it is the balance point; the mean is the value each data point would take on if the total value of all the data points were redistributed fairly.
2. When the mean and median of a data set differ substantially, both measures should be provided, and the difference explained in terms of the data values.

Core Standards · Students can and do:

a. Collect data to answer a predefined question about a measurement quantity. Make a dot plot to display the data, and describe the data using measures of center and measures of variation.[51]

Geometry

Core Standards · Students understand that:

1. Triangles and parallelograms can be dissected and reassembled into rectangles with the same area; this leads to a formula for area in terms of base and height.
2. Polygons can be dissected into triangles in order to find their area.

Core Standards · Students can and do:

[49] Glossary: Rational number. A number expressible in the form a/b for integers a and $b \neq 0$. The rational numbers include positive and negative integers, positive and negative fractions, and 0.
[50] A caution for temperature problems: The rational numbers are not a good model for a temperature scale. There is no temperature that solves the equation $T + 1000°C = 0$.
[51] Data sets should include fractional values at this grade but not negative values.

a. Find the area of right triangles, other triangles, special quadrilaterals, and polygons (by dissection into triangles and other shapes).
b. Find surface area of cubes, prisms and pyramids (include the use of nets to represent these figures).
c. Solve problems involving area, volume and surface area of objects.
d. Examine the relationship between volume and surface area. Exhibit rectangular prisms with the same surface area and different volume, and with the same volume and different surface area.
e. Use exponents and symbols for square roots and cube roots to express the area of a square and volume of a cube in terms of the side length, and to express the side length in terms of the area or volume.

Expressions and Equations

Core Standards · Students understand that:

1. A number that is the result of a sequence of operations with other numbers can be expressed in different ways using conventions about order of operations and parentheses, rules for working with fractions, and the Properties of Arithmetic. All such expressions are equivalent.
2. A letter is used to stand for a number in an expression in cases where one doesn't know what the number is, or where, for the purpose at hand, it can be any number in the domain of interest. Such a letter is called a variable.
3. An equation is a statement that two expressions are equal, and a solution to an equation is a value of the variable (or a set of values for each variable if there is more than one variable) that makes the equation true.

Core Standards · Students can and do:

a. Represent an unknown number using a letter in simple expressions such as $y + 2$, $y - 3$, $6 + y$, $5 - y$, $3y$, $y/2$, and $(3+y)/5$.
b. Interpret $3y$ as $y + y + y$ or $3 \times y$, $y/2$ as $y - 2$ or $1/2 \times y$, $(3+y)/5$ as $(3 + y) - 5$ or $1/5 \times (3 + y)$.[52]
c. Evaluate simple expressions when values for the variables in them are specified (exclude expressions with a variable in denominator).
d. Choose variables to represent quantities in a word problem and construct simple equations to solve the problem by reasoning about the quantities.
e. Solve equations of the form $x + p = q$ (for $p < q$) and $px = q$ where p and q are fractions.

[52] From Singapore Secondary 1

Mathematics: Seventh Grade

Developing Coherent Understanding

[Temporarily removed for editing.]

Ratios and Proportional Relationships

Core Standards · Students understand that:

1. Two variable quantities x and y are said to be proportional to one another if the ratio x/y is always equal to the same quantity k, so that $y = kx$. The constant k is the unit rate, and tells how much of y per unit of x.

Core Standards · Students can and do:

a. Compare proportional relationships represented in different ways (e.g. compare a graph to an equation to determine which of two objects has greater speed).
b. Decide whether two quantities that vary together have a proportional relationship, analyze proportional relationships using the unit rates that characterize them, and solve word problems involving proportional relationships.
c. Plot pairs (x, y) from a proportional relationship $y = kx$, and pass a straight line through them and the origin. Observe that increases in y are proportional to increases in x, and calculate [increase in y]/[increase in x] = k.

The Number System

Core Standards · Students understand that:

1. On the number line, the sum $p + q$ is defined to be the number lying distance $|q|$ from p, to the right of p if q is positive and to the left of p if q is negative. A number and its opposite are additive inverses (add to zero).[53]
2. Sums of signed numbers can be computed using the Properties of Arithmetic.[54]
3. The additive inverse of a sum is the sum of the additive inverses.[55]
4. Subtraction is defined as adding the additive inverse. This definition of subtraction allows subtraction of rational numbers and agrees with previous understandings of subtraction with positive numbers.[56] On the number line, the difference $p - q$ lies distance $|q|$ from p, to the left of p if q is positive and to the right of p if q is negative.
5. The absolute value of $p - q$ equals the distance between p and q on the number line.
6. Products of signed numbers can be computed using the Properties of Arithmetic.[57] In particular, multiplying a number by –1 produces its additive inverse.[58]

[53] Glossary: Additive Inverses. Two numbers whose sum is 0 are additive inverses of one another. Example: $3/4$ and $-3/4$ are additive inverses of one another because $3/4 + (-3/4) = (-3/4) + 3/4 = 0$.
[54] For example, 7 + (–3) = 4 because 7 + (–3) = (4 + 3) + (–3) = 4 + [3 + (–3)] = 4 + [0] = 4. And (–2) + (–3) = –5 because 5 + [(–2) + (–3)] = (2 + 3) + [(–2) + (–3)] = [2 + (–2)] + [3 + (–3)] = [0] + [0] = 0 so (–2) + (–3) is the additive inverse of 5, that is –5.
[55] For example, –(6 + –2) = (–6) + 2 because [6 + (–2)] + [(–6) + 2] = [6 + (–6)] + [(–2) + 2] = [0] + [0] = 0.
[56] For example, the subtraction 7 – 3 means 7 plus the additive inverse of 3, i.e. 7 + (–3), which equals 4. The subtraction 9 – (–4) means 9 plus the additive inverse of –4, i.e. 9 + 4, which equals 13.
[57] For example, (–1) × (–1) = 1 because (–1) + (–1) × (–1) = 1 × (–1) + (–1) × (–1) = [1 + (–1)] × (–1) = 0 × (–1) = 0.
[58] Because (–1) × a + a = (–1) × a + (1) × a = [(–1) + (1)] × a = 0 × a = 0.

7. Every nonzero rational number has a multiplicative inverse. Division of rational numbers is defined as multiplying by the multiplicative inverse.
8. The operation of adding the rational number q to points on the number line is a translation; it shifts points to the right if $q > 0$, to the left if $q < 0$, and not at all if $q = 0$. The operation of adding $–q$ undoes the operation of adding q.
9. The operation of multiplying points on the number line by a positive rational number k is a dilation; it scales points further away from zero if $k > 1$, closer to zero if $k < 1$, and not at all if $k = 1$. The operation of multiplying by $1/k$ undoes the operation of multiplying by k.

Core Standards · Students can and do:

a. Explore and explain with number lines the rules for adding rational numbers, e.g., $r + s = s + r$; $r + (–s) = r – s$; $p – (q + r) = p – q – r$.
b. Use the rules of arithmetic to explore and explain with specific numbers the rules for multiplying rational numbers, e.g., 4×-5 is -5 added to itself 4 times, so equal to -20; $-3 \times (-2 + 2) = -3 \times 0 = 0$, so $-3 \times -2 = -(-3) \times 2 = -(-6) = 6$.
c. Add and subtract rational numbers, and use these operations to solve word problems (including signed quantities such as elevation, temperature, account balance, and so on).
d. Multiply and divide rational numbers, and use these operations to solve word problems (including signed quantities).

Expressions and Equations

Core Standards · Students understand that:

1. Expressing a quantity in different forms serves a purpose in analyzing quantitative situations.
2. The distributive property can be used in two directions, both to expand linear expressions, and to factor a sum of terms with a common factor.

Core Standards · Students can and do:

a. Construct algebraic expressions for simple real-world situations and generate equivalent expressions to interpret their meaning (e.g., $P + 0.05P = 1.05P$ means that "increase by 5%" is the same as "multiply by 1.05").
b. Generate equivalent expressions from a given expression, including putting linear expressions in standard form and taking out a common factor. Include expressions involving negative numbers and exponents 2 and 3.
c. Solve multi-step word problems that lead to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are rational numbers, by undoing the operations involved in producing the expression on the left, using additive and multiplicative inverses.
d. Solve simple absolute value equations of the form $|x + h| = j$ and $|x – h| = j$, where h and j are integers.
e. Read the structure in a numerical expression at a level necessary to enter it into a calculator or spreadsheet, making use of parentheses and the conventions on order of operations.

Statistics

Core Standards · Students understand that:

1. In addition to measurement variability, another source of variation in data is randomness.

Core Standards · Students can and do:

a. Collect experimental or simulation data from repeated random trials. Make a histogram showing absolute frequencies and a bar graph of relative frequencies. Discuss the patterns and make predictions for further experiments or simulations.

Probability

Core Standards · Students understand that:

1. Chance events fall along a spectrum: nearly impossible | unlikely | neither likely nor unlikely | likely | nearly certain.
2. Probability is a quantitative measure of likelihood. Probabilities are numbers lying between 0 and 1, with 0 representing impossible and 1 representing certain (in the case of a finite sample space).
3. The experimental probability of a specified outcome is the observed fraction of the outcome in a data set collected from a process involving randomness or chance.
4. In a random process, the individual outcomes are unpredictable, but patterns may emerge after repeated trials. Experimental probabilities in random experiments tend to approach stable values as more and more data is generated.
5. In a theoretical probability model, the set of distinct possible outcomes for a random experiment is called the sample space. An event is a set of sample points; a sample point may belong to several events. A specified event occurs in some fraction of the sample space. This fraction is called the theoretical probability of the event.
6. When computing theoretical probabilities, all members of the sample space are assumed equally probable. Theoretical probabilities will not match long-run experimental probabilities if this assumption is inappropriate (e.g., as in the case of a loaded die).

Core Standards · Students can and do:

a. Compute experimental probabilities from data sets, including data sets generated by simulations or sampling experiments.
b. Compute experimental probabilities to estimate theoretical probabilities when no theoretical probability model is apparent.
c. Represent sample spaces for one-stage random experiments; identify members of the sample space in which specified events occur.
d. Use a theoretical probability model to compute theoretical probabilities for one-stage random experiments, expressing theoretical probabilities as fractions, decimals and percents.
e. Compare experimental probabilities to theoretical probabilities for one-stage random experiments, examining and if feasible revising the assumptions of the theoretical model when the two conflict.

Geometry

Core Standards · Students understand that:

1. Two polygons are congruent[59] if and only if there is a correspondence between vertices so that the corresponding sides are equal and the corresponding angles are equal.
2. A plane or solid figure is similar to another if the second can be obtained from the first by a similarity transformation.[60] All ratios of lengths in the second figure to corresponding lengths in the first figure are equal to the scale factor of the dilation.

[59] Glossary: Congruent. Two plane or solid figures are *congruent* if one can be obtained from the other by a sequence of rigid motions (rotations, reflections, and translations).
[60] Glossary: Similarity transformation. A rigid motion followed by a dilation. Glossary: Dilation. A transformation that moves each point along the ray through the point emanating from a fixed center, and multiplies distances from the center by a common scale factor.

3. Congruent figures have the same area or volume. A similarity transformation with a scale factor of k leaves angle measures unchanged, changes lengths by a factor of k, changes areas by a factor of k^2, and changes volumes by a factor of k^3.
4. Given a line in the coordinate plane not parallel to either axis, any two right triangles with legs parallel to the axes and hypotenuse on the given line are similar, and so the slope of the line (rise over run) is the same regardless of which two distinct points are used to compute it.

Core Standards· Students can & do:

a. Solve problems involving similar triangles and scale drawings (including computing actual lengths, areas and volumes from a scale drawing and reproducing a scale drawing at a different scale).
b. Explore using hands-on activities the area of non-rectangular figures and the perimeter of curvilinear figures, and the fact that a dilation of the plane changes areas by the square of the scale factor.[61]
c. Use scale factors to find lengths and areas of similar figures, including an informal derivation of the formulas relating the area, radius and circumference of a circle.
d. Give an explanation of why the volume of a cylinder is the area of the base times the height, using informal arguments involving slices.
e. Use coordinate grids to transform figures and to predict the effect of dilations, translations, rotations and reflections.
f. Use two-dimensional representations of three-dimensional objects (schematics, assembly instructions, perspective drawings and multiple views) to solve problems.
g. Explore three-dimensional figures formed by translations and rotations of plane figures through space.
h. Sketch and describe cross-sections of cones, cylinders, pyramids and prisms.

[61] Include using grids of squares with fractional side lengths to estimate area, and measuring the length of strings wrapped around the perimter.

Mathematics: Eighth Grade

Developing Coherent Understanding

[Temporarily removed for editing.]

Functions and the Situations They Model

Core Standards · Students understand that:

1. A function is a rule, often defined by an expression, that states a relationship between the values of two variable quantities.
2. A linear function models a situation where the change in one quantity is proportional to the corresponding change in the other quantity. The constant of proportionality, m, is the rate of change of the function. If x is the input and y is the output then the function is defined by $y = mx + b$ for some constant b, which is called the initial value of the function (the value of the function when x is 0).
3. The graph of a linear function $y = mx + b$ is a straight line, and the slope of the line is the function's rate of change.
4. The problem of finding where two linear functions have the same output value for a common input value leads to an equation in one variable; the solution or solutions (if any) can be visualized as the input value(s) where the graphs of the functions intersect.
5. A linear equation in one variable can be solved by successively transforming it into simpler equations with the same solutions using the Properties of Arithmetic and the Properties of Equality, until an equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).

Core Standards · Students can and do:

a. Compare features of two or more functions that may be presented in different representations (as formulas, graphs, tables of values, or verbally).
b. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship; from two (x, y) values (including reading these from a table); or from a graph.
c. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
d. Solve linear equations with rational number coefficients, including equations that require expanding expressions using the distributive law and collecting like terms.

The Number System

Core Standards · Students understand that:

1. The number line has numbers that are not rational, such as 2π or $2 + \sqrt{3}$, called irrational numbers.
2. An irrational number can be approximated to arbitrary precision by rational numbers.
3. If $n > 0$ is an integer and $\sqrt{n}$ is not an integer, then $\sqrt{n}$ is irrational. If q is rational and r is irrational, then $q + r$ is irrational, and so is qr provided $q \neq 0$.

Core Standards · Students can and do:

a. Use rational approximations to compare the size of irrational numbers, locate them approximately on a number line and estimate the value of expressions (e.g. π^2).

Geometry

Core Standards · Students understand that:

1. Angle measures formed by a configuration of lines in a plane can often be deduced from other angle measures (e.g., vertically opposite angles, angles produced when a transversal line cuts two parallel lines).
2. The side lengths of a right triangle are related by the Pythagorean theorem.

Core Standards · Students can and do:

a. Explore and explain by hands-on activities facts about the angle sum of triangles, exterior angles, and alternate interior angles of parallel lines. Use these facts to determine the angle sum of interior angles of convex polygons, and the angle sum of exterior angles of convex polygons.[62]
b. Explore and explain using hands-on activities: parallel lines in space, line perpendicular to a line through a given point, lines perpendicular to a plane, lines parallel to a plane, the plane passing through three given points, and the plane perpendicular to a given line at a given point.
c. Use facts about angles to write and solve simple equations for an unknown angle in a figure.
d. Explain a proof of the Pythagorean theorem.[63]
e. Use the Pythagorean theorem to determine missing side lengths in right triangles and to solve problems in two and three dimensions.
f. Use the Pythagorean theorem to find the distance between two points in a coordinate system.
g. Draw (freehand, with ruler and protractor, and with technology) geometric shapes from given conditions. (Focus on constructing triangles from three measures of angles or sides, noticing when the triangle is uniquely defined, ambiguous, or impossible.)
h. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc): copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.
i. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

Statistics

Core Standards · Students understand that:

1. Scatterplots for bivariate continuous data may reveal patterns of association between two quantities. This kind of relationship between quantities is not a functional relationship—and yet, a function might be a valuable way to describe a statistical relationship.

Core Standards · Students can and do:

a. Construct and interpret scatterplots for bivariate measurement data.
b. Describe patterns that appear in scatterplots, such as clustering, outliers, positive/negative association, linear association, nonlinear association.
c. For scatterplots that suggest a linear association, model the relationship with a linear function using an informal fitting procedure. Use the model function to solve problems in the context of the data,

[62] Use physical models, transparencies, or dynamic geometry software to make rigid motions and give informal arguments, for example, arrange three copies of the same triangle so that the three angles form a line, and give an argument in terms of transversals why this is so.
[63] For example, by the method of right triangles in a square.

interpreting the slope/rate of change and intercept/initial value. Informally assess the goodness of the model by judging the closeness of the data points to the graph of the function.

Probability

Core Standards · Students understand that:

1. The framework for theoretical probability models is the same for compound events as for simple events: the theoretical probability is the fraction of the sample space in which the compound event occurs.

Core Standards · Students can and do:

a. Compute experimental probabilities from data sets, including data sets generated by simulations or repeated sampling experiments.
b. Compute experimental probabilities to estimate theoretical probabilities of compound events when no theoretical probability model is apparent.
c. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams; identify members of the sample space in which specified events occur.
d. Compute theoretical probabilities for compound events by counting members of the sample space.
e. Compare experimental probabilities to theoretical probabilities for multi-stage random experiments, examining the assumptions of the theoretical model when the two conflict.

Mathematics: High School—Expressions

A Coherent Understanding of Expressions

[Final draft of CCR narrative goes here.]

Seeing structure in expressions

Core Standards · Students understand that:

1. Different forms of expression for functions reveal different properties of the function; a purpose in transforming expressions is to find those properties.

   For example, factoring a quadratic expression reveals the zeros of the function it defines, and putting the expression in vertex form reveals the maximum or minimum of the function; the expression 1.15^t can be rewritten in the form $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ to reveal the approximate monthly interest rate if the annual rate is 15%.

2. The laws of exponents for whole number exponents follow from an understanding of exponents as indicating repeated multiplication, and from the associative property of multiplication.

3. The interpretation of zero, fractional and negative exponents follows from extending the laws of exponents to those values.

   For example, since $(x^{1/3})^3 = x^{(1/3)3} = x^1 = x$, $x^{1/3}$ is the cube root of x.

4. Complex expressions can be interpreted by "chunking": temporarily viewing a part of the expression as a single entity.

Core Standards · Students can and do:

a. Factor, expand, and complete the square in quadratic expressions.
b. Use chunking to see expressions in different ways that suggest ways of rewriting them.

   For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.

c. Rewrite expressions using the laws of exponents.

   For example $(x^{1/2})^3 = x^{3/2}$ and $1/x = x^{-1}$.

d. Use the laws of exponents to interpret expressions for exponential functions, recognizing fractional exponents as indicating roots of the base and negative exponents as indicating the reciprocal of a power.

   For example, identify the relative rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.2)^{10t}$, $y = (1.01)^{12t}$, and recognize that any non-zero number raised to the 0 power is 1 (for example, $12(1.05)^0 = 12$). Avoid common errors such as confusing as $6(1.05)^t$ with $(6\cdot1.05)^t$ and $5(0.03)^t$ with $5(1.03)^t$.

e. Given an expression for an exponential function, identify whether it represents exponential growth or decay.
f. Using a method such as the factorization $(x^n-1) = (x-1)(x^{n-1} + \ldots + 1)$ where n is a whole number, prove the formula for the sum of a geometric series, and use the formula to solve problems.

   Include problems involving compound interest and mortgage payments.

The arithmetic of polynomials and rational functions

Core Standards · Students understand that:

1. Polynomials form a system analogous to the integers, closed under the operations of addition, subtraction, and multiplication.

2. A polynomial of degree n has n complex roots, where roots are counted according to multiplicity.
3. For a polynomial $p(x)$, $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.
4. The Binomial Theorem gives the expansion of $(x + a)^n$ in powers of x for a whole number n and a real number a, with coefficients determined for example by Pascal's triangle. The Binomial Theorem can be proved by mathematical induction.
5. Rational functions are fractions whose numerator and denominator are polynomials, and the rational functions are closed under the operation of division by a nonzero rational function.

Core Standards · Students can and do:

a. Add, subtract and multiply polynomials.
b. Identify zeros of polynomials when suitable factorizations are available, and graph polynomials.
c. Transform simple rational functions using the Properties of Arithmetic and the rules for operations on fractions.
d. Identify zeros and asymptotes of rational functions, when suitable factorizations are available, and graph rational functions.
e. Divide polynomials by monomials

Mathematics: High School—Equations

A Coherent Understanding of Equations

[Final draft of CCR narrative goes here.]

Building equations to model relations between quantities

Core Standards · Students understand that:

1. Choosing a unit for a general quantity (e.g. length) establishes a correspondence between specific instances of the quantity (e.g. lengths of specific objects) and numbers called coordinates.
2. A relation between two quantities can be represented by an equation in variables representing coordinates for the quantities; by a graph on a pair of axes marked with units for the quantities; and by a table of coordinate pairs from the relation. The graph and the table show pairs that are solutions to the equation.

Core Standards · Students can and do:

a. Build equations to express relations between quantities and solve problems.

   Include equations arising from situations involving linear, quadratic, simple rational, and exponential functions.

b. Rearrange formulas to isolate a quantity of interest.
c. Build systems of equations and solve problems involving systems of equations.

Reasoning with equations and inequalities

Core Standards · Students understand that:

1. To solve an equation algebraically, one assumes it is true and deduces the solutions, often in steps that replace it with a simpler equation whose solutions include the solutions of the original one.
2. Adding a number to both sides of an equation, or multiplying both sides by a nonzero number, leads to an equation that has exactly the same solutions as the original.
3. If the product of two numbers is zero, then at least one equals zero, and conversely. This principle is the basis for solving equations by factoring.
4. Multiplying both sides of an equation by an expression that can be zero for certain values of the variables in it, or squaring both sides of an equation, can lead to an equation that has more solutions than the original. Evaluating these in the original equation eliminates extraneous solutions.
5. The method of completing the square can transform any quadratic equation in x into an equivalent equation of the form $(x - p)^2 = q$. This leads to the quadratic formula.
6. Equations not solvable in one number system may have solutions in a larger number system.
7. Equations of the form $f(x) = g(x)$ can be solved graphically by finding the intersections (if any) of the graphs of $f(x)$ and $g(x)$.
8. The relationship between a function f and its inverse (if it has one) can be used to solve equations of the form $f(x) = c$. For example, a logarithmic function can help solve exponential equations, and an inverse trigonometric function can help solve trigonometric equations.
9. Given a system of linear equations, adding a multiple of one equation to another produces a system with the same solutions. This principle, combined with principles already encountered with equations in one variable, allows for the simplification of systems.

10. The solutions to an equation in two variables form a graph—a set of points, often a curve or a line, in the coordinate plane.
11. The solutions to two equations in two variables (if any) can be visualized as the points of intersection of their graphs, because those points satisfy both equations simultaneously.
12. The solution to a system of inequalities in two variables can be visualized as the intersection of the regions in the plane defined by the inequalities.

Core Standards · Students can and do:

a. Solve simple rational and radical equations, noting and explaining extraneous solutions.
b. Solve quadratic equations over the real numbers by completing the square, using the quadratic formula and factoring.
c. Solve linear inequalities in one variable and graph the solution set on a number line.

   Emphasize solving the associated equality and determining on which side of the solution of the associated equation the solutions to the inequality lie.

d. Solve linear systems of equations algebraically, focusing on pairs of linear equations in two variables.
e. Graph a system of two linear or quadratic equations in two unknowns and estimate the solution from a graph.
f. Graph the solution set of a linear inequality in two variables.
g. Use the properties of logarithms to solve equations involving exponential functions.
h. Use inverse trigonometric functions to solve equations of the form $A\sin(Bx + C) = D$.
i. Find complex roots of quadratic equations.
j. Solve a system of two quadratic equations in two unknowns.

Mathematics: High School—Functions

A Coherent Understanding of Functions

[Final draft of CCR narrative goes here.]

Interpreting functions

Core Standards · Students understand that:

1. The domain of a function is the set of its inputs, and the range is the set of its outputs.
2. Function notation uses a letter to stand for a function. If f is a function and x is a number in its domain, then $f(x)$ indicates the output of f corresponding to the input x.
3. Functions can be described by key characteristics, including: zeros; vertical intercept; extreme points; average rates of change (over intervals); intervals of increasing, decreasing and/or constant behavior; and end behavior.
4. Linear, quadratic and exponential functions are defined by expressions that have forms specific to each type, in which the parameters can often be interpreted in terms of characteristics of the graph.
5. An equation in two variables implicitly expresses one variable as a function of the other if there are no points on the graph having the same value of the first variable but different values of the second.
6. When x is a power of ten, the common logarithm $\log(x)$ tells the exponent. When x lies between 10^n and 10^{n+1}, $\log(x)$ lies between n and $n+1$.

Core Standards · Students can and do:

a. Describe qualitatively the functional relationship between two quantities by reading a graph; e.g., where the function is increasing or decreasing, what its long run behavior appears to be, and whether it appears to be periodic.
b. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
c. Compare values and properties of two functions represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions).
d. Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes.
e. Describe the qualitative behavior of common types of functions using graphs and tables.

   Identify: intercepts; intervals where the function is increasing, decreasing, positive or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. Use technology to explore the effects of parameter changes on the graphs of linear, power, quadratic, square root and cube root, polynomial, simple rational, exponential, logarithmic, sine and cosine, absolute value and step functions.

f. Interpret the parameters in the general expressions for linear, quadratic, and exponential functions, and draw conclusions about the parameters by inspection of the graph.
g. Given a function f, and given a constant c, evaluate $f(c)$ if possible and find solutions to $f(x) = c$ (if they exist). Where appropriate, relate the possibility of evaluation to the domain and the existence or nonexistence of solutions to the range.

Building functions

Core Standards · Students understand that:

1. Varying a parameter in the general expression for a linear, quadratic or exponential function can (often) be interpreted as performing a geometric transformation on the graph. This can be used to adjust a function to model a particular situation.

2. Composing a function f with a function g creates a new function called the composite function—for an input number x, the output of the composite function is $f(g(x))$.
3. The inverse of a function "undoes" what the function does; that is, composing the function with its inverse in either order returns the original input.
4. Sequences are functions whose domain is the whole numbers, and they can be defined recursively as well as explicitly. Arithmetic sequences are linear functions and geometric sequences are exponential functions.

Core Standards · Students can and do:

a. Make graphs of linear, quadratic, cubic, absolute value and exponential functions, and, given the graph of one of these types, identify the type.
b. Sketch graphs of quadratic functions presented in the form $y = ax^2+bx+c$, $y = a(x-h)^2+k$ and $y = a(x-p)(x-q)$ (without plotting points).
c. Solve problems involving quadratic functions, such as analyzing projectile motion and maximizing profit.
d. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$. Include both positive and negative k; find the value of k given the graphs.
e. Write an expression of the form $a(1+r)^t$ or ab^t for an exponential function to express a constant percent growth rate or a constant growth factor.
f. Evaluate composite functions and compose functions symbolically in simple cases (e.g. one or both functions linear).
g. Read values of an inverse function from a graph or a table, given that the function has an inverse.
h. For linear or simple exponential functions, find a formula for an inverse function by solving an equation.
i. For linear functions or simple exponential functions, verify symbolically by composition that one function is the inverse of another.
j. Write arithmetic and geometric sequences both recursively and in closed form, and translate between the two forms.

Linear vs. exponential behavior

Core Standards · Students understand that:

1. Linear functions grow by equal differences in equal time periods; exponential functions grow by equal factors in equal time periods.
2. The rate of change of a linear function is constant; the rate of change of an exponential function is proportional to the value of the function.
3. Exponential growth eventually outstrips polynomial growth (including, in particular, linear growth).

Students can and do:

a. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
b. Interpret absolute and relative rates of change and use them to make predictions.
c. Identify the initial value and growth or decay rate from a table or graph of an exponential function.
d. Calculate and interpret the growth factor for an exponential function (presented symbolically or as a table) given a fixed time interval. Estimate the growth factor from a graph.
e. Recognize a quantitative relationship as linear or exponential from description of a situation.

Trigonometric functions

Core Standards · Students understand that:

1. The unit circle in the coordinate plane enables one to extend the domains of the sine, cosine and tangent functions of right-triangle trigonometry to the real numbers.
2. Trigonometric functions are periodic by definition, and sums and products of these functions are periodic.
3. Restricting trigonometric functions to a domain on which they are always increasing or always decreasing allows for the construction of an inverse function.

Core Standards · Students can and do:

a. Use radian measure and revisit graphs of trigonometric functions in terms of radians.
b. Use the unit circle to determine geometrically the values of sine, cosine, tangent for multiples of $\pi/4$ and $\pi/3$; commit sines and cosines of principal angles to memory.
c. Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.
d. Solve simple trigonometric equations formally using inverse trigonometric functions;[64] evaluate solutions using technology.
e. Explain relationships between the identity $\sin^2 x + \cos^2 x = 1$, the equation of a circle, and the Pythagorean theorem.
f. Explain proofs of the sine and cosine addition and subtraction formulas.
g. Use trigonometric identities to simplify expressions.
h. Use trigonometric functions to solve problems in science, economics or other fields where periodic phenomena occur.

[64] Solving trigonometric equations by means of the quadratic formula is optional.

Mathematics: High School—Coordinates

A Coherent Understanding of Coordinates.

[Final draft of CCR narrative goes here.]

Expressing geometric properties with equations

Core Standards · Students understand that:

1. The graph of a linear equation is the straight line through any two of its solutions. Conversely, any line is the set of solutions to some linear equation.
2. Two lines with well-defined slopes are parallel if their slopes are equal and perpendicular if their slopes multiply to –1.
3. The equation of a circle can be found using its definition and the Pythagorean theorem.
4. Transforming the graph of an equation by reflecting in the axes, translating parallel to the axes, or applying a dilation to one of the axes correspond to substitutions in the equation.

   For example, reflection in the *y* axis corresponds to $(x,y) \rightarrow (-x,y)$, translation vertically down by three units corresponds to $(x,y) \rightarrow (x,y+3)$, and dilating by a factor of 2 parallel to the x-axis corresponds to $(x, y) \rightarrow (x/2, y)$.
5. An ellipse is obtained by stretching a circle, leading to an equation of the form $x^2/a^2 + y^2/b^2 = 1$.
6. The formula $A = \pi ab$ for the area of an ellipse can be derived from the formula for the area of a circle.

Core Standards · Students can and do:

a. Write the equation of a line in point-slope form, slope-intercept form, or standard form.
b. Identify parallel and perpendicular lines in a coordinate plane, and use the relationship between slopes of parallel and perpendicular lines to solve problems. Know the equations of vertical and horizontal lines.
c. Find the point on the segment between two given points that divides the segment in a given ratio.
d. Complete the square to find the center and radius of a circle given by an equation.
e. Find an equation for an ellipse given the lengths of its major and minor axes; calculate the area of an ellipse.
f. Use coordinates to solve geometric problems.

   Include: proving simple geometric theorems algebraically, using coordinates to compute perimeters and areas for triangles and rectangles, finding midpoints of line segments, finding distances between pairs of points and determining when two lines are parallel or perpendicular.

Vectors and matrices[65]

Core Standards · Students understand that:

1. Vectors are quantities having both magnitude and direction. They are typically represented by directed line segments.
2. On a coordinate plane, vectors are determined by the coordinates of their initial and terminal points or by their *x*- and *y*-components.

[65] Limit to vectors in the plane and 2x2 matrices.

3. Vectors can be added end-to-end, component-wise, or by the parallelogram rule. The length of the sum of two vectors is typically not the sum of the lengths.
4. Translations of the plane can be represented by vectors.
5. Vectors are often used to describe "directed quantities" in physics, such as position, velocity, acceleration and force. Vector addition is used to find resultant forces or compute displacements.
6. Multiplying a 2x2 matrix into a vector produces another vector. This can be viewed as a transformation of the plane.
7. A system of two linear equations in two variables can be represented as a single matrix equation in a vector variable.
8. Matrices can be added, subtracted and multiplied.
9. The zero and identify matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a 2x2 matrix determines whether it has a multiplicative inverse.

Core Standards · Students can and do:

a. Represent vectors graphically.
b. Perform basic vector operations (addition, subtraction, scalar multiplication) both graphically and algebraically.
c. Use vectors to model and solve problems.
d. Use trigonometry to decompose a vector into perpendicular components.
e. Add, subtract and multiply matrices.
f. Represent systems of equations as matrix equations.
g. Find the inverse of a matrix if it exists and use it to solve equations.

Complex Numbers

Core Standards · Students understand that:

1. To solve quadratic equations that have no solutions in the real numbers, the number system can be extended to include the square roots of –1, creating a closed number system called the complex numbers.
2. The Properties of Arithmetic and the relation $i^2 = -1$ can be used to perform operations on complex numbers.
3. All polynomials can be factored over the complex numbers, e.g. as in $x^2 + 4 = (x + 2i)(x - 2i)$.
4. Complex numbers can be visualized on the complex plane. Real numbers fall on the horizontal (real) axis, and imaginary numbers fall on the vertical axis.
5. On the complex plane, arithmetic of complex numbers can be interpreted geometrically: addition is analogous to vector addition, and multiplication can be understood as rotation and dilation about the origin. Complex conjugation is reflection across the real axis.
6. The absolute value (or modulus) of a complex number is defined as its distance from the origin in the complex plane. On the complex plane, as on the real line, the distance between numbers is the absolute value of the difference, and the midpoint of a segment is the average of the numbers at its endpoints.
7. Euler's formula $e^{\theta} = \cos\theta + i \sin\theta$ links complex numbers to trigonometry.

Core Standards · Students can and do:

a. Add, subtract and multiply complex numbers.
b. Find the conjugate of complex a number and use it to find absolute values and divide complex numbers.
c. Graph complex numbers in both rectangular and polar form and interpret arithmetic of complex numbers geometrically.

d. Solve quadratic equations over the complex numbers.
e. Convert complex numbers between rectangular and polar form.
f. Re-derive trigonometric identities using complex methods.

Mathematics: High School—Modeling

A Coherent Understanding of Modeling.

Modeling uses mathematics to help us make sense of the real world—to understand quantitative relationships, make predictions, and propose solutions.

A model can be very simple, such as a geometric shape to describe a physical object like a coin. Even so simple a model involves making choices. It is up to us whether to model the solid nature of the coin with a three-dimensional cylinder, or whether a two-dimensional disk works well enough for our purposes. For some purposes, we might even choose to adjust the right circular cylinder to model more closely the way the coin deviates from the cylinder.

In any given situation, the model we devise depends on a number of factors: How precise an answer do we want or need? What aspects of the situation do we most need to understand, control, or optimize? What resources of time and tools do we have? The range of models we can create and analyze is constrained as well by the limitations of our mathematical and technical skills. For example, modeling a physical object, a delivery route, a production schedule, or a comparison of loan amortizations each requires different sets of tools. Networks, spreadsheets and algebra are powerful tools for understanding and solving problems drawn from different types of real-world situations. One of the insights provided by mathematical modeling is that essentially the same mathematical structure might model seemingly different situations.

The basic modeling cycle is one of (1) identifying the key features of a situation, (2) creating geometric, algebraic or statistical objects that describe key features of the situation, (3) analyzing and performing operations on these objects to draw conclusions and (4) interpreting the results of the mathematics in terms of the original situation. Choices and assumptions are present throughout this cycle.

The modeling cycle and general tools

Core Standards · Students understand that:

1. The behavior of quantities in physical, economic, public policy, social and everyday situations can be modeled using mathematics. Mathematics is used to model relationships among quantities, constraints and objectives.
2. Models are formulated to answer questions about the world based on an analysis of the situation and a conceptual model that involves assumptions and choices.
3. Quantities in the situation are represented by variables in the model, usually through measurement. Modeling includes decisions about what to measure and how, and how well the measurements work for the purpose.
4. Mathematical knowledge and skill are required in order to get results from a mathematical model—even to devise a model in the first place. Areas of mathematics commonly used in modeling include linear, quadratic, exponential or other functions; probability and statistics; and geometry (solid, plane and coordinate). In active modeling, fluency with math content is required in order to focus on the larger problem.
5. Technology is often required in order to obtain results from a model.
6. The results of a mathematical model must be evaluated against evidence and the phenomena at hand. If the mathematics is correct, then unreasonable results point to unreasonable assumptions and the need to revise the model.
7. Real-world problems do not announce that they are amenable to mathematical analysis and solution; bringing mathematics to bear on such a problem is a highly creative act.

Core Standards · Students can and do:

a. Creatively apply the mathematics they know to situations in which it only imperfectly applies—and achieve useful results by doing so.

   For example, independently choose to describe HIV transmission as a random event with a fixed probability per sexual encounter.

b. Decide what measures are relevant to a problem.

   For example, given the purpose at hand, is traffic safety best measured in terms of fatalities per year or fatalities per vehicle-mile? (or fatalities per 100 million vehicle-miles?)

c. Use network diagrams or other techniques to visualize complex situations with many factors, causes or agents.

   For example, what agents and factors are responsible for setting the price of gasoline? How do they interact?

d. In situations with many factors, causes or agents, organize the factors/causes/agents into a hierarchy of importance.

   For example, what are the primary, secondary, and relatively rare causes of lung cancer?

e. Use order of magnitude estimates, unprompted, to identify important effects, disregard unimportant effects and predict results of a more detailed model.
f. Use 2-by-2 tables, flowcharts, and other strategies to organize information and manage scenarios.

Modeling with geometry, equations, functions, probability, and statistics

Core Standards · Students can and do:

a. Model physical objects with geometric shapes.

   Include common objects that can reasonably be idealized as two- and three-dimensional geometric shapes. Identify the ways in which the actual shape varies from the idealized geometric model.

b. Model situations with equations and inequalities.

   Include situations well described by a linear inequality in two variables or a system of linear inequalities defining a region in the plane.

c. Model situations with common functions.

   Include situations well described by linear, quadratic or exponential functions; and situations that can be well described by inverse variation ($f(x) = k/x$). Include identifying a family of functions that models features of a problem, and identifying a particular function of that family and adjusting it to fit by changing parameters. Understand the recursive nature of situations modeled by linear and exponential functions.

d. Model situations using probability and statistics.

   Include using simulations to model probabilistic situations; describing the shape of a distribution of values and summarizing a distribution with measures of center and variability; modeling a bivariate relationship using a trend line or a regression line.

Mathematics: High School—Statistics

A Coherent Understanding of Statistics.

[Final draft of CCR narrative goes here.]

Summarizing and interpreting categorical, count and measurement data

Core Standards · Students understand that:

1. Statistical methods take variability into account to support making informed decisions based on quantitative studies designed to answer specific questions.
2. Visual displays and summary statistics condense the information in data sets into usable knowledge.

Core Standards · Students can and do:

a. Summarize comparative or bivariate categorical data in two-way frequency tables; interpret joint, marginal and conditional relative frequencies in the context of the data.
b. Compare data on two or more count or measurement variables by using plots on the real number line (dot plots, histograms and box plots); use appropriate statistics to summarize center (median, mean) and spread (interquartile range, standard deviation) of the data sets; interpret changes in shape, center and spread in the context of the data sets, accounting for possible effects of extreme data points.
c. Summarize bivariate quantitative data by giving a regression line and a measure of goodness of fit.

Making inferences and justifying conclusions drawn from data

Core Standards · Students understand that:

1. Statistics is a process for making inferences about population parameters based on a sample from that population; randomness is the foundation for statistical inference.
2. The design of an experiment or sample survey is of critical importance to analyzing the data and drawing conclusions.

Core Standards · Students can and do:

a. Use probabilistic reasoning to decide if a specified model is consistent with a given data-generating process.
b. Recognize the purposes of and differences among sample surveys, experiments and observational studies; explain how randomization relates to each.
c. Use data from a sample survey to estimate a population parameter.
d. Use data from a randomized experiment to compare two treatments.
e. Evaluate reports based on data.

Mathematics: High School—Probability

A Coherent Understanding of Probability.

[Final draft of CCR narrative goes here.]

Modeling random events with finite sample spaces

Core Standards · Students understand that:

1. Random phenomena can be modeled mathematically using a sample space in which sample points represent distinct outcomes, and in which each sample point is assumed to have the same probability.
2. Events are subsets of a sample space that can be defined using characteristics (or categories) of the sample points, as well as unions, intersections, or complements thereof ('and', 'or', 'not'). A sample point may belong to several events (categories).
3. If A and B are two events (categories), then the conditional probability of A given B, denoted by $p(A \mid B)$, is the fraction of sample points in B that also lie in A.
4. The laws of probability can be used to generate new probabilities from known probabilities.

Core Standards · Students can and do:

a. Compute theoretical probabilities of compound events by constructing and analyzing representations, including tree diagrams, systematic lists, and Venn diagrams
b. Use the addition and multiplication laws of probability to compute probabilities of complementary, disjunctive, and compound events.
c. Apply concepts such as intersections, unions and complements of events, and conditional probability and independence, to define or analyze compound events, calculate probabilities, and solve problems.
d. Construct and interpret two way tables to show probabilities when two characteristics (or categories) are associated with each sample point. Use a two way table to determine conditional probabilities.
e. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
f. Use permutations and combinations to compute probabilities of compound events and solve problems.

Experimenting and simulating to model probabilities

Core Standards · Students understand that:

1. Sets of data obtained from surveys, simulations, or other means, can be used as probability models, by treating the data set itself as a sample space, in which the sample points are the individual pieces of data. The probability of an event within the data set is its relative frequency.
2. The law of large numbers provides the basis for estimating certain probabilities by use of empirical relative frequencies.
3. The probability of an outcome can be interpreted as an assertion about the long-run proportion of the time the outcome will occur if the random experiment is repeated a large number of times. The observed proportion of occurrence for the outcome of interest can be used as an estimate of the relevant probability.

Core Standards · Students can and do:

a. Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes.

b. Compare the results of simulations (e.g., random number tables, random functions, and area models) with predicted probabilities. When there are substantial discrepancies between predicted and observed probabilities, explain them in terms of the assumptions of the probability model.
c. Use the relationship between conditional probabilities and relative frequencies in contingency tables to analyze decision problems.
d. Use the mean and standard deviation of a data set to fit it to a normal distribution (bell-shaped curve) and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets and tables to estimate areas under the normal curve.
e. Apply the binomial theorem to solve probability problems.

Using probability to make decisions

Core Standards · Students understand that:

1. A probability distribution is a collection of probabilities $\{p_1, \ldots, p_n\}$ for a set of mutually exclusive and jointly exhaustive events $\{E_1, \ldots, E_n\}$. The probabilities in a probability distribution sum to unity.
2. A random variable attaches a value to each event in a probability distribution. The expected value of the random variable is the weighted average of its possible values, with weights given by their respective probabilities.
3. When the possible outcomes of a decision can be assigned probabilities and payoff values, the decision can be analyzed as a random variable with an expected value, e.g. of a wager. If possible, this is the first thing to compute in a decision context.

Core Standards · Students can and do:

a. Calculate expected value to analyze mathematical fairness, payoff.
b. Evaluate and compare options in situations where all of the available options share the same expected value but carry different levels of risk.
c. Analyze each of two options and make a quantitatively informed decision in situations where one option has both a higher expected return and a higher level of risk. Include both low-stakes and high-stakes decisions.
d. Analyze decision problems using probability concepts.

Mathematics: High School—Geometry

A Coherent Understanding of Geometry.

[Final draft of CCR narrative goes here.]

Triangle Congruence

Core Standards · Students understand that:

1. Rigid motions move lines to lines and segments to segments; preserve the distance between points; and preserve measures of angles.
2. Two geometric figures are congruent if there is a sequence of rigid motions that carries one onto the other. This is the principle of superposition.
3. Criteria for triangle congruence can be thought of as answers to the following question: What information about the measures in a triangle ensures that all triangles drawn with those measures are congruent?
4. Criteria for triangle congruence can be established using rigid motions.

Core Standards · Students can and do:

a. Use (in reasoning and problem solving) precise definitions of angles, polygons, parallel and perpendicular lines, rigid motions (rotations, reflections, translations), parallelograms and rectangles; commit these definitions to memory.
b. Prove theorems about lines and angles; test conjectures and identify logical errors in fallacious proofs.

Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; measures of supplementary angles sum to 180°; two lines parallel to a third are parallel to each other; points on a perpendicular bisector of a segment are exactly those equidistant from the segment's endpoints.

c. Prove theorems about triangles; test conjectures and identify logical errors in fallacious proofs.

Theorems include: measures of interior angles of a triangle sum to 180°, base angles of isosceles triangles are equal, the triangle inequality, the longest side of a triangle faces the largest side and vice-versa, the exterior-angle inequality, and the segment joining midpoints of two sides of a triangle parallel to the third side and half the length.

d. Use and prove properties of and relationships among special quadrilaterals: parallelogram, rectangle, rhombus, square, trapezoid and kite.
e. Characterize parallelograms in terms of equality of opposite sides, in terms of equality of opposite angles, and in terms of bisection of diagonals; characterize rectangles as parallelograms with equal diagonals.

Similarity, Right Triangles and Trigonometry

Core Standards · Students understand that:

1. The dilation of a given line is parallel to the given line. (In particular, lines passing through the center remain unchanged.)
2. The dilation of a given segment is parallel to the given segment and longer or shorter in the ratio given by the scale factor. A dilation leaves a segment unchanged if and only if the scale factor is 1.
3. The assumed properties of dilations can be used to establish the AA, SAS and SSS criteria for similarity of triangles.
4. Similarity allows one to view side ratios in right triangles as properties of the angles themselves, leading to elementary definitions of sine, cosine and tangent.

Core Standards · Students can and do:

a. Use triangle similarity criteria to solve problems and to prove relationships in geometric figures.
b. Prove that two lines with well-defined slopes are parallel if and only if they have the same slope, and perpendicular if and only if the product of their slopes is equal to –1.
c. Give an informal explanation using successive approximation that a dilation of scale factor r changes the length of a curve by a factor of r and the area of a region by a factor of r^2.
d. Use and explain the relationship between the trigonometric ratios of complementary angles.
e. Use trigonometric ratios and the Pythagorean theorem to solve right triangles[66] in applied problems.

Circles

Core Standards · Students understand that:

1. All circles are similar.
2. There is a unique circle through three non-collinear points, or tangent to three non-concurrent lines.

Core Standards · Students can and do:

a. Identify and describe relationships among angles, radii, and chords.

Include: the relationship between central, inscribed and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.

b. Identify and define radius, diameter, chord, tangent, secant and circumference.
c. Determine the arc lengths and the areas of sectors of circles, using proportions.
d. Construct a tangent line from a point outside a given circle to the circle.
e. Prove and use basic theorems about circles, and use these theorems to solve problems. Include:

- Symmetries of a circle
- Similarity of a circle to any other
- Tangent line, perpendicularity to a radius
- Inscribed angles in a circle, relationship to central angles, and equality of inscribed angles
- Properties of chords, tangents and secants as an application of triangle similarity.

Axiomatic Systems

Core Standards · Students understand that:

1. Mathematical statements are proven or disproven by deductive reasoning. Conjectures can arise from inductive reasoning, but they cannot be proven that way.
2. Precise definitions make possible rigorous logical reasoning, and definitions shared in common make possible the objective evaluation of one's own reasoning by others.
3. Logical reasoning requires avoiding common fallacies, such as using an example to prove the rule or confusing a statement with its converse.
4. Axiomatic systems require precise definitions, but some terms must be left "undefined." The axioms specify how the undefined terms behave.
5. The first three postulates of the *Elements* are models of straightedge and compass construction.
6. Hilbert and other mathematicians improved on the *Elements* by identifying its hidden assumptions and making them explicit with additional axioms.

[66] A right triangle has five parameters, its three lengths and two acute angles. Given a length and any other parameter, "solving a right triangle" means finding the remaining three parameters. (It is worth reflecting on why this problem is well-posed.)

7. Three classical construction problems (trisecting an angle, duplicating a cube and squaring a circle) inspired the development of much important mathematics.
8. The Parallel Postulate (axiom) distinguishes Euclidean geometry from other geometries. Other geometries, such as spherical and hyperbolic geometry, use alternatives to the Parallel Postulate. Many theorems of Euclidean geometry are not theorems in other geometries.

Core Standards · Students can and do:

a. Use the terms point, line and plane to define other geometric terms as line segments, angles and rays.
b. With ruler and compass:
   - Divide a segment into any number of equal parts.
   - Given two segments of lengths r and s, construct a segment of length rs and one of length r/s.
   - Given a segment of length r, construct a segment of length $\sqrt{r}$.

Trigonometry of General Triangles

Core Standards · Students understand that:

1. The Law of Sines generalizes the side-angle inequality.
2. The Law of Cosines generalizes the Pythagorean theorem.
3. The Laws of Sines and Cosines embody the triangle congruence criteria, in that three pieces of information are usually sufficient to completely solve a triangle. Furthermore, these laws yield two possible solutions in the ambiguous case, illustrating that "Side-Side-Angle" is not a congruence criterion.

Core Standards · Students can and do:

a. Explain proofs of the Law of Sines and the Law of Cosines.
b. Use the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

Geometric Measurement and Dimension

Core Standards · Students understand that:

1. Congruence plays a fundamental role defining the concepts of length, area and volume.
2. Areas of polygons can be computed by dissecting them into triangles and using the fundamental property of area, that the area of a dissected figure is the sum of the areas of its components.
3. Lengths of curves and areas of curved regions can be defined informally using the concept of "limit."
4. Cavalieri's principle allows one to understand volume formulas informally by visualizing volumes as stacks of thin slices.

Core Standards · Students can and do:

a. Give definitions of rectangular prism, (right) pyramid, (right circular) cone, (right circular) cylinder and sphere.
b. For a pyramid or a cone, give an heuristic argument to show why its volume is (1/3) its height times the area of its base.
c. Use the behavior of length and area under dilations to prove the formulas for the circumference and area of a circle.

d. Apply formulas and solve problems involving volume and surface area of right prisms, right circular cylinders and right pyramids, cones, spheres and composite figures.
e. Identify and apply the 3:2:1 relationship among volumes of circular cylinders, hemispheres and cones with same height and circular base and 3:1 relationship between volume of a prism and pyramid with same base area and height.
f. Identify cross-sectional shapes of slices of three-dimensional objects, and identify three-dimensional objects traced out by rotations of two-dimensional objects.

Mathematics: High School—Calculus

Calculus is an important part of the high school curriculum for a large and growing number of students. To see well-established standards for this course, please see course descriptions such as those of the College Board, International Baccalaureate Organization, or any of the following states: California, Florida, Hawaii, Indiana, Mississippi, Pennsylvania, South Carolina, Tennessee, Utah, and Virginia. We invite feedback from states as to whether they would like to see Calculus in future drafts of the Common Core Standards.

Progressions in Grades K–8

Note, a progression may appear in more than one band.

Grades K-5

Number

- Counting and Cardinality
- Base Ten Computation
- Early Relations and Operations
- Quantity and Measurement
- Operations and the Problems They Solve
- Fractions

Geometry

- Shapes
- Coordinates
- Geometry

Data

- Statistics

Grades 6-8

Number

- The Number System

Algebra

- Ratios and Proportional Relationships
- Expressions and Equations
- Functions and the Situations They Model

Geometry

- Geometry

Data

- Statistics
- Probability

List of Progressions and Grade Ranges

Strand	Progression	Start	End
Number	Counting and Cardinality	K	K
	Early Relations and Operations	K	1
	Base Ten Computation	K	5
	Quantity and Measurement	K	5
	Operations and the Problems They Solve	2	4
	Fractions	3	5
	Ratios and Proportional Relationships	6	7
	The Number System	6	8
Geometry	Shapes	K	4
	Coordinate Geometry	5	5
	Geometry	6	8
Algebra*	Expressions and Equations	6	7
	Functions & The Situations They Model	8	8
Data*	Statistics	5	8
	Probability	7	8

* The Algebra and Data strands have concepts and skills in earlier grades that progressions in the Number strand.

GLOSSARY

Additive inverses. Two numbers whose sum is 0 are additive inverses of one another. Example: $3/4$ and $-3/4$ are additive inverses of one another because $3/4 + (-3/4) = (-3/4) + 3/4 = 0$.

Algorithm. A step by step routine that always gives some answer, rather than ever giving no answer; that always gives the right answer, and never gives a wrong answer; that can always be completed in a finite number of steps, rather than in an infinite number of steps; and that applies to all problems of a given type (e.g., adding any two multidigit whole numbers, or bisecting any angle). Cf. Wikipedia's "effective procedure," from which this definition is adapted.

Common logarithm. The common logarithm of x is the power to which you raise 10 in order to get x.

Congruent. Two plane or solid figures are congruent if one can be obtained from the other by a sequence of rigid motions (rotations, reflections, and translations).

Dilation. A transformation that moves each point along the ray through the point emanating from a fixed center, and multiplies distances from the center by a common scale factor.

Integer. A positive whole number, a negative whole number, or 0.

Mean. The sum of the values in a list divided by the number of values in the list. (To be more precise, this defines the *arithmetic mean*.)

Median. In a list of values, the value appearing at the center of a sorted version of the list or the mean of the two central values, if the list contains an even number of values.

Multiplicative inverses. Two numbers whose product is 1 are multiplicative inverses of one another. Example: $3/4$ and $4/3$ are multiplicative inverses of one another because $3/4 \times 4/3 = 4/3 \times 3/4 = 1$.

Range. The difference between the greatest and smallest values in a list of numbers.

Rational number. A number expressible in the form a/b for integers a and $b \neq 0$. The rational numbers include positive and negative integers, positive and negative fractions, and 0.

Related fractions. Two fractions are *related* if one denominator is a factor of the other. (See Ginsburg, Leinwand and Decker (2009), *Informing Grades 1-6 Mathematics Standards Development: What Can Be Learned from High-Performing Hong Kong, Korea, and Singapore*, Table A1, p. A-5, grades 3 and 4.)

Similarity transformation. A rigid motion followed by a dilation.

Single-place number. The numbers that result when a whole number between 1 and 9 (inclusive) is multiplied by the numbers 10, 100, 1000, etc.

Teen number. A whole number that is greater than or equal to 11 and less than or equal to 19.

Transitive property of measurement order. If one object is bigger than a second, and the second object is bigger than a third object, then the first object is bigger than the third object.

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

What follows is a sample of sources consulted in the drafting of the Core Standards for Reading, Writing, and Speaking and Listening. Citations are organized by the standard to which they pertain. For example, all sources with specific relevance to reading standard #1 are listed below that standard. Each citation contains a link to the section of the source document that is relevant to the core reading, writing, or speaking and listening standard to which it corresponds. For more information on sources and how they were used in the drafting of the core standards, please refer to the "College and Career Readiness Standards for Reading, Writing, and Speaking and Listening."

Reading Evidence

Reading 1. Determine both what the text says explicitly and what can be inferred logically from the text.

College Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts*. Washington, DC: Achieve, Inc. (see sample post-secondary assignment #4, pgs. 98-99)
- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Entrance Examination Board (see pg. 7- skills rated by importance to post-secondary instructors- skill #2 "Making inferences and drawing conclusions")
- ACT. (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #4 and #15).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).
- *AP European and World History Course Descriptions* (2009), New York, NY: College Board (see pgs. 21-24 in AP European History for document-based question expectations). AP World and U.S. History also have these expectations.

Career Readiness

- ACT. (2006). *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: ACT. (pgs. 3-5, see Table 2 "Main Ideas and Supporting Details")
- *Hawai'i Career Ready Study*. (2007). Commissioned by the Hawai'i P-20 Initiative. (see sample task "Review Commercial Real Estate Loan Application," Banking/Loan Officer; see sample task "Review claim letter," Insurance/Claims Agent)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 30.2.1.2.a)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

    2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see B6, B7)
    3. **Ireland:** *Leaving Certificate/English Syllabus* for Higher Level and Ordinary Level (≈ Grades 10-11) (see 5.4.a. Higher; 5.5.a. Ordinary)
    4. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (see 1.4. Grade 12 Reading & Literature Studies)

- A counterpart of this standard also appears in the English language arts standards of the following :

    1. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 8.1.d, 8.2.d, 8.3.c)

- Organization for Economic Cooperation and Development. (2006). *PISA 2006: Science Competencies for Tomorrow's World, Vol. 1* (see pg. 293, Reading Proficiency Levels 2 and 4) (PISA 2006, Vol. 1, full PDF)
- Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills*. Paris, France: Organization for Economic Cooperation and Development. (pgs. 112-115, esp. pg.114 "Retrieving Information")

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Reading Competencies, Comprehension and Retention, bullet 14)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see 1.A.2)
- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California:** *English-Language Arts Content Standards for California Public Schools*. (see 2.5. Grades 11-12, 2.0 Reading Comprehension Grades 11-12, 2.2.a-e Writing Applications Grades 11-12)
    2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 8: Understanding a Text, General Standard 12: Fiction, General Standard 13: Nonfiction)

U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009*. Washington, DC: National Assessment Governing Board. (see "Locate and Recall," see "Integrate and Interpret," see Basic and Advanced – Literary: Proficient – Informational)

Reading 2. Support or challenge assertions about the text by citing evidence in the text explicitly and accurately.

College Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts*. Washington, DC: Achieve, Inc. (see sample post-secondary assignment #6, pgs. 102-103)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices.* New York, NY: College Entrance Examination Board (see pg. 7- skills rated by importance to post-secondary instructors- skill #7 "Justifying a personal interpretation of a text through specific references")
- ACT. (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #4 and #15).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).
- *AP European and World History Course Descriptions* (2009), New York, NY: College board (see pgs. 21-24 in AP European History for document-based question expectations). AP 5 high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 10/20/30 2.3.2.b and 30.3.2.3.c)
  2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see B8)
  3. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (see 1.4 &1.7, Grade 12 Reading & Literature Studies)
  4. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 1, Outcome 1, Key Skill 4; Unit 3, Outcome 1, Key Skill 3)

- A counterpart of this standard also appears in the English language arts standards of the following :

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.2.d)

- Organization for Economic Cooperation and Development. (2006). *PISA 2006: Science Competencies for Tomorrow's World, Vol. 1* (see pg. 289, example PISA item "Graffiti") (PISA 2006, Vol. 1 full PDF)
- Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills.* Paris, France: Organization for Economic Cooperation and Development. (see pg. 115, "Reflecting on and Evaluating the Content of a Text")

Illustrative Alignment with State and Other Standards

- U.S. Dept. of Education. (2009). *Reading Framework for the 2009 National Assessment of Educational Progress.* Washington, DC: National Assessment Governing Board. (see Proficient-Informational bullet 1)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see L.A.2)
- A counterpart of this standard appears in the English language arts standards from the following states:

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

1. **California:** *English-Language Arts Content Standards for California Public Schools.* (see 2.4, Reading Comprehension Grades 11-12; 2.2.b, Grades 9-10, 3.2 Literary Response and Analysis Grades 11-12, 2.2.c Writing Applications Grades 11-12)
2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see 8.30, General Standard 11: Theme, 11.5, 11.7; General Standard 13: Nonfiction:General Standard 15: Style and Language)

Reading 3. Discern the most important ideas, events, or information, and summarize them accurately and concisely.

College Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (see sample post-secondary assignment #4, pgs. 98-99)
- *Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices. New York, NY: College Entrance Examination Board* (see pg. 7- skills rated by importance to post-secondary instructors- skill #1 "Identifying and/or summarizing the theme or central argument of a text," skill #4 "Understanding and paraphrasing points made in a text")
- ACT (2006), *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #2, #3, #6).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (see Informational Text 2, Survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results.* (see row 9, Survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).

Career Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (Workplace Task #5, pg. 82-83)
- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (See point 3 on pg. 13; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

- ACT. (2006). *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: ACT. (pgs. 3-5, see Table 2 "Main Ideas and Supporting Details")

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

1. **Alberta, Canada:** *English Language Arts Curriculum Outcomes*, 2003 (Grades 10-12) (see 20.2.1.2.b)
2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see B6, B7)
3. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Reading bullet 2)
4. **Ireland:** *Leaving Certificate/English Syllabus for Higher Level and Ordinary Level* (≈ Grades 10-11) (see 4.1.1.a; 4.1.1.c)
5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.3, Grade 12 Reading & Literature Studies)

- A counterpart of this standard also appears in the English language arts standards of the following :

    1. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 8.1.b, 8.2.b, 8.3.a)

- Organization for Economic Cooperation and Development. (2006). PISA 2006: *Science Competencies for Tomorrow's World, Vol. 1* (see pg. 291, example PISA item "Runners") (PISA 2006, Vol. 1 full PDF)
- Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills.* Paris, France: Organization for Economic Cooperation and Development. (see pg. 113, "Forming a Broad General Understanding")

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities. (see Making the Reading/Writing Connection bullet 2; Reading Competencies, Comprehension and Retention bullets 1, 2 and 5)
- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 8: Understanding a Text)

- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009.* Washington, DC: National Assessment Governing Board. (see "Locate and Recall", see Basic-Informational bullet 1)

Reading 4. Delineate the main ideas or themes in the text and the details that elaborate them.

College Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (see sample post-secondary assignment #4, pgs. 98-99)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- ACT (2006), *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #2, #3, #6).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (see Informational Text 2, Survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results.* (see row 9, Survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).

Career Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (Workplace Task #5, pg. 82-83)
- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (See point 2, page 12; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)
- ACT. (2006). *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: ACT. (pgs. 3-5, see Table 2 "Main Ideas and Supporting Details")

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Alberta, Canada:** *English Language Arts Curriculum Outcomes*, 2003 (Grades 10-12) (see 20.2.1.2.b; 10/20/30.2.3.2.i)
    2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package, Prescribed Learning Outcomes*, 2007 (Grade 12) (see B6, B7)
    3. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Reading bullet 2)
    4. **Ireland:** *Leaving Certificate/English Syllabus for Higher Level and Ordinary Level* (≈ Grades 10-11) (see 4.1.1.a)
    5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.3 and 1.6, Grade 12 Reading & Literature Studies)
    6. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 1, Outcome 1, Key Knowledge 1; Unit 2, Outcome 1, Key Skill 2; Unit 3, Outcome 2, Key Knowledge 2)

- A counterpart of this standard also appears in the English language arts standards of the following :

    1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 1.4.a-b)
    2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11)
    (Did not participate in PISA) (see 8.1.b-c, 8.2.b; 9.1.c)

- Organization for Economic Cooperation and Development. (2006). PISA 2006: *Science Competencies for Tomorrow's World, Vol. 1* (see pg. 291, example PISA item "Runners") (PISA 2006, Vol. 1 full PDF)
- Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills.* Paris, France: Organization for Economic Cooperation and Development. (see pg. 114, "Forming a Broad General Understanding")

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see pg. 17, F2 - in 12 of 12 states analyzed)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities. (see Reading Competencies, Comprehension and Retention bullets 5 and 6, Listening)
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **Massachusetts:** English Language Arts Curriculum Framework, June 2001. (see General Standard 8: Understanding a Text, 8.30; General Standard 11: Theme, 11.5, 11.6, 11.7)

- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009.* Washington, DC: National Assessment Governing Board. (see "Locate and Recall", see 12th Grade)

Reading 5. Determine when, where, and why events unfold in the text, and explain how they relate to one another.

College Readiness

- ACT. (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #11, #14, #21, #24).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (see Informational Text 6. Survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10.)
- *Florida American Diploma Project Survey Results.* (see row 20. Survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).

Career Readiness

- ACT. (2006). *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: ACT. (pgs. 3-5, see Table 2 "Sequential, Comparative, and Cause-Effect Relationships")

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (see points 1 and 2, page 12; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 30.2.1.2.b)
  2. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 2.0.1)
  3. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Reading bullets 3 and 10; Language Development bullet 2, dash 2)
  4. **Ireland:** *Leaving Certificate/English Syllabus* for Higher Level and Ordinary Level (≈ Grades 10-11) (see 4.2.1.b, Higher Level)
  5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.6, Grade 12 Reading & Literature Studies)

- A counterpart of this standard also appears in the English language arts standards of the following :

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.2.a; 2.2.k)

- Organization for Economic Cooperation and Development. (2006). *PISA 2006: Science Competencies for Tomorrow's World, Vol. 1* (see pg. 293, Reading Proficiency Level 3)(PISA 2006, Vol. 1 full PDF)
- Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills.* Paris, France: Organization for Economic Cooperation and Development. (pg. 115, "Developing an Interpretation")

Illustrative Alignment with State and Other Standards

- U.S. Dept. of Education. (2009). *Reading Framework for the 2009 National Assessment of Educational Progress.* Washington, DC: National Assessment Governing Board. (see Proficient – Literary bullet 2)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see LA.4)
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** *English-Language Arts Content Standards for California Public Schools.* (see 3.6, Reading Comprehension Grades 9-10)
  2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 13: Nonfiction, 13.25, 13.27)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Reading 6. Analyze the traits, motivations, and thoughts of individuals in fiction and nonfiction based on how they are described, what they say and do, and how they interact.

College Readiness

- ACT (2008) *College Readiness Standards*. Iowa City IA (see p. 21: Sequential, Comparative, and Cause-Effect Relationships)
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 30.2.1.2.d; 30.2.3.1.c; 20/30.2.3.2.d; 10/20/30.5.1.1.e)
    2. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 1, Outcome 1, Key Knowledge 1)

- A counterpart of this standard also appears in the English language arts standards of the following :

    1. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 9.2.d; 8.2.d)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see pg. 17, H8– in 9 of 12 states analyzed)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see LA.4)
- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009*, Washington, DC: National Assessment Governing Board. (see Proficient bullets 1 and 3 and Advanced bullet 3- Literary, see "Integrate and Interpret")
- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California:** *English-Language Arts Content Standards for California Public Schools* (see Reading 3.3, 3.4, grades 9-10)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Reading 7. Determine what is meant by words and phrases in context, including connotative meanings and figurative language.

College Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (see sample post-secondary assignment #6, pgs. 102-103)
- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices.* New York, NY: College Entrance Examination Board (see pg. 7- skills rated by importance to post-secondary instructors- skill #8 "Determining the meaning of unfamiliar words from context," skill #18 "Understanding figurative language...")
- ACT. (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted to clarify which skills are most important to post-secondary instructors, see skill #7, skill #19).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (See Language 4. Survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).

Career Readiness

- ACT (2006). *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: ACT. (pgs. 3-5, see Table 2 "Meaning of Words")
- ACT (2009) See ACT WorkKeys "Reading for Information" Level 5 requirements (Level 5 is workplace training and college ready).
- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (see pg. 11, point d; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Alberta, Canada:** *English Language Arts Curriculum Outcomes*, 2003 (Grades 10-12) (see 20.2.1.2.f)
    2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see B6; B13)
    3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 2.CC.1)
    4. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (Listening, bullet 8; Reading, bullets 1 and 12)
    5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12, see 3.1-3.3, Reading and Literature Studies)

6. **Victoria, Australia**: *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 2, Outcome 1, Key Knowledge 4)

- A counterpart of this standard also appears in the English language arts standards of the following :

1. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 7.d)

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Reading Competencies, Comprehension and Retention bullet 15; Listening bullet 3)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see I.B.3)
- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009.* Washington, DC: National Assessment Governing Board. (see "Vocabulary Assessment on the 2009 Reading Assessment," see pg. 47 "Preliminary Achievement Levels: Vocabulary")
- A counterpart of this standard appears in the English language arts standards from the following states:

1. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (General Standard 4: Vocabulary and Concept Development, 4.23)

Reading 8. Analyze how specific word choices shape the meaning and tone of the text.

College Readiness

- *Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices. New York, NY: College Entrance Examination Board* (see pg. 7- skills rated by importance to post-secondary instructors- skill #14: "Understanding words that have multiple definitions," skill #17: "Distinguishing between connotative and denotative meanings of words," skill #20: "Identifying the tone of the the text.")
- ACT. (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #7, #10, and #19).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).

Career Readiness

Illustrative International Benchmarks

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

1. **Alberta, Canada**: English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 30.2.1.2.f; 20.2.1.2.e; 30.2.2.2.h and c)
2. **British Columbia, Canada**: *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see B13)
3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 2.CC.1; AI 5.CC.3)
4. **Ireland:** *Leaving Certificate/English Syllabus* for Higher Level and Ordinary Level (≈ Grades 10-11) (see 4.3.1.a; 4.1.1.h)
5. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) Outcome 4: C-4, 4.1, 4.2, 4.3, HSC; C-4, 4.1, 4.2, Preliminary and C-7.1, Preliminary)
6. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 2.3, Grade 12 Reading and Literature)
7. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 3, Outcome 2, Key Knowledge 1)

- A counterpart of this standard also appears in the English language arts standards of the following :

1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.2.j; 2.2.m)
2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 6.b)

- Organization for Economic Cooperation and Development. (2006). *PISA 2006: Science Competencies for Tomorrow's World, Vol. 1* (see pg. 289, example PISA item "Graffiti") (PISA 2006, Vol. 1 full PDF).

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see pg. 17, A6- in 11 of 12 states analyzed)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see I.C.3)
- A counterpart of this standard appears in the English language arts standards from the following states:

1. **California:** *English-Language Arts Content Standards for California Public Schools* (see 2.2 Reading Comprehension Grades 11-12; 3.3 Literary Response and Analysis Grades 11-12, 2.2.d Writing Applications Grades 11-12)
2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see 14.6; and General Standard 15: Style and Language, 15.7, 15.10)

- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009.* Washington, DC: National Assessment Governing Board. (see Proficient - Literary bullet 4, see "Critique and Evaluate")

Reading 9. Analyze how the text's organizational structure presents the argument, explanation, or narrative.

College Readiness

- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).
- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices.* New York, NY: College Entrance Examination Board (see pg. 7- skills rated by importance to post-secondary instructors- skill #3 "Understanding organizational strategies such as introduction, supporting examples, summary")
- ACT. (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #2, #6, #10, #12).

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada**: English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 30.2.2.1.a; 30.2.2.1.c)
  2. **British Columbia, Canada**: *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see B12)
  3. **Finland**: *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 2.CC.1)
  4. **Hong Kong**: *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Reading, bullet 10)
  5. **Ireland**: *Leaving Certificate/English Syllabus* for Higher Level and Ordinary Level (≈ Grades 10-11) (see 4.2.1.b; 4.4.1.c; 4.1.1.b; 5.5.b. Ordinary Level; 5.4.c. Higher Level)
  6. **New South Wales, Australia**: *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see Outcome 4; C-4, 4.1, 4.2, Preliminary)
  7. **Ontario, Canada**: *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.6, Grade 12 Reading and Literature)
  8. **Victoria, Australia**: *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 4, Outcome 2, Key Knowledge 1 and Skill 1; Unit 1, Outcome 1, Key Skills 1 and 4; Unit 1, Outcome 2, Key Knowledge 1 and 2; Unit 2, Outcome 1, Key Knowledge 2 and 4 and Skill 1; Unit 3, Outcome 1, Key Knowledge 2 and Skill 1; Unit 2, Outcome 3, Key Knowledge 2)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- A counterpart of this standard also appears in the English language arts standards of the following :

  1. **England**: *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.2.1 and 2.2.k)
  2. **Singapore**: *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 6.b, 7.c)

- Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills.* Paris, France: Organization for Economic Cooperation and Development. (pg. 116, "Reflecting on and Evaluating the Form of a Text")
- Organization for Economic Cooperation and Development. (2006). *PISA 2006: Science Competencies for Tomorrow's World, Vol. 1* (See pg. 289, example PISA item "Graffiti") (PISA 2006, Vol. 1 full PDF)

Illustrative Alignment with State and Other Standards

- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see I.C.3)
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California**: *English-Language Arts Content Standards for California Public Schools* (see Reading 2.2, grades 11-12)
  2. **Massachusetts**: *English Language Arts Curriculum Framework*, June 2001. (see General Standard 13: Nonfiction 13.25, 13.27)

- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009.* Washington, DC: National Assessment Governing Board. (see "Critique and Evaluate")

Reading 10. Analyze how specific details and larger portions of the text contribute to the meaning of the text.

College Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (see sample post-secondary assignment #4, pgs. 98-99)
- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices.* New York, NY: College Entrance Examination Board (see pg. 7- skills rated by importance to post-secondary instructors- skill #6 "Identifying the purpose of a portion of the text")
- ACT. (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #2, #10, #12, #16).

- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (see Informational Text 2. Survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results.* (see row 9. Survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).

Career Readiness

- ACT. (2006). *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: ACT. (pgs. 3-5, see Table 2 "Main Ideas and Supporting Details")

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 30.2.1.2.b; 10/20/30.2.3.2.f)
  2. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 2.0.1)
  3. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.6, Grade 12 Reading & Literature Studies)

- A counterpart of this standard also appears in the English language arts standards of the following:

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 1.4.a)
  2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 8.1.c)

- Organization for Economic Cooperation and Development. (2006). *PISA 2006: Science Competencies for Tomorrow's World, Vol. 1* (see pg. 293, Reading Proficiency Level 3) (PISA 2006, Vol. 1 full PDF)
- Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills. Paris, France: Organization for Economic Cooperation and Development.* (see pgs. 112-115, esp. pg.114 "Retrieving Information," and "Forming a Broad General Understanding")

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see pg. 17, F2- in 12 of 12 states analyzed)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Reading Competencies, Comprehension and Retention bullet 6; Reading Competencies, Depth of Understanding bullet 4)
- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009.* Washington, DC: National Assessment Governing Board. (see "Locate and Recall", see "Integrate and Interpret")
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** *English-Language Arts Content Standards for California Public Schools.* (see 2.2.a-e, Writing Applications Grades 11-12)
  2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 8: Understanding a Text, 8.33, 8.34, General Standard 15: Style and Language, 15.8)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Reading 11. Synthesize data, diagrams, maps, and other visual elements with words in the text to further comprehension.

College Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (see sample post-secondary assignment #2, pgs. 92-93; sample post-secondary assignment #3, pgs. 94-97)
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (see Informational Text 5. Survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results.* (see Row 28. Survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (Workplace Tasks #1-4, pgs. 74-81.)
- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (See point 2, page 12; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)
- ACT. (2006). *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: ACT. (pgs. 3-5, see Table 3 "Data Representation and Statistical Thinking"- WorkKeys Column, Skill 3)
- *Hawai'i Career Ready Study.* (2007). Commissioned by the Hawai'i P-20 Initiative. (see sample task "Build wall frame and building ramp," Construction/Carpenter; sample task "Draft memo to all employees," Hotel/Guest Services Manager; see also P5 for the occupational tasks for which this skill is important.)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **British Columbia, Canada**: *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see B12)
    2. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Numeracy Skills, Senior Secondary, bullet 2 and 1 and 2)
    3. **Ontario, Canada**: *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 2.1, Grade 12 Reading and Literature)

- A counterpart of this standard also appears in the English language arts standards of the following :

    1. **Singapore**: *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 7.a)

- Organization for Economic Cooperation and Development. (2006). *PISA 2006: Science Competencies for Tomorrow's World, Vol. 1* (see pg. 290, example PISA item "Lake Chad," and pg. 288 example PISA item "Labour") (PISA 2006, Vol. 1 full PDF)
- Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills*. Paris, France: Organization for Economic Cooperation and Development. (pgs. 110-111, "Non-Continuous Texts")

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see pg. 17, F5- in 12 of 12 states analyzed)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Reading Competencies bullet 1)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see LE.1 and LE.2)
- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009.* Washington, DC: National Assessment Governing Board. (see "Procedural Texts and Documents", see "Integrate and Interpret")
- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California:** *English-Language Arts Content Standards for California Public Schools* (see 2.1, Reading Comprehension Grades 9-10)

Reading 12. Extract key information efficiently in print and online using text features and search techniques.

College Readiness

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (see Research 2. Survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results.* (see Row 10. Survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Alberta, Canada:** *English Language Arts Curriculum Outcomes*, 2003 (Grades 10-12) (see 10/20/30.3.2.1.b, 10/20/30.2.1.4.a)
    2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package, Prescribed Learning Outcomes*, 2007 (Grade 12) (see B6)
    3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see A1.2.0.4)
- A counterpart of this standard also appears in the English language arts standards of the following :

    1. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 9.1.a, 8.1.b)

Illustrative Alignment with State and Other Standards

- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California:** *English-Language Arts Content Standards for California Public Schools* (see 2.1, Reading Comprehension Grades 9-10)

Reading 13. Ascertain the origin, credibility, and accuracy of print and online sources.

College Readiness

- ACT. (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skill #5).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (see Research 3. Survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results.* (see row 18. Survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Career Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (see sample Workplace Task #5, see sample Workplace Task #6, pg. 82-85)
- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (see point 4 on pg. 13; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 10/20/30.3.2.2.a, 10/20/30.3.2.2.c, 10/20/30.3.2.2.d)
  2. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see A1 2.0.4)
  3. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.5, Grade 12 Writing)

- A counterpart of this standard also appears in the English language arts standards of the following :

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.2.f)
  2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 9.1.f)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see pg. 17, E4- in 12 of 12 states analyzed)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Writing Competencies – Style/Expression bullet 4 and Technological Competencies bullet 7)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see III.B.5 and III.B.7*)
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** *English-Language Arts Content Standards for California Public Schools* (see 2.3, Reading Comprehension, Grades 11-12, 2.4, Writing Applications Grades 11-12)

- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009.* Washington, DC: National Assessment Governing Board. (see "Multiple Texts")

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Reading 14. Evaluate the reasoning and rhetoric that support an argument or explanation, including assessing whether the evidence provided is relevant and sufficient.

College Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (see sample post-secondary assignment #5, pgs. 100-101)
- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices.* New York, NY: College Entrance Examination Board (see pg. 7- skills rated by importance to post-secondary instructors- skill #5 "Distinguish fact from opinion," skill #10 "Identifying logical flaws or discrepancies in an author's argument)
- ACT. (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #5, #8, #9, #12, #17, #18, #20).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (see Logic 4. Survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).
- *AP European and World History Course Descriptions* (2009), New York, NY: College Board (see pgs. 21-24 in AP European History for document-based question expectations). AP World and U.S. History also have these expectations.

Career Readiness

- Achieve, Inc. (2004). *The American Diploma Project, Ready or Not: Creating a High School Diploma that Counts.* Washington, DC: Achieve, Inc. (see sample workplace task #6, pg. 84-85)
- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (see point 4 on pg. 13 and point 2 on pg. 18; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada**: English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 30.3.2.2.d, 10/20/30/3.2.2.c)
  2. **British Columbia, Canada**: *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see B9)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 4.CC.1 and 3)
4. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Reading bullets 4, 6, 7 and 13; Critical Thinking bullets 1 and 5)
5. **Ireland:** *Leaving Certificate/English Syllabus* for Higher Level and Ordinary Level (≈ Grades 10-11) (see 4.2.1.a-c)
6. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 2, Outcome 3, Key Knowledge 1 and Skills 1 and 2; Unit 3, Outcome 2, Key Knowledge 2)

- A counterpart of this standard also appears in the English language arts standards of the following :

1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 1.4.c and 2.2.f)
2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 9.1.c, 7.c)

- Organization for Economic Cooperation and Development. (2006). *PISA 2006: Science Competencies for Tomorrow's World, Vol. 1* (See pg. 289, example PISA item "Graffiti") (PISA 2006, Vol. 1 full PDF)
- Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills.* Paris, France: Organization for Economic Cooperation and Development. (pg. 115, "Reflecting on and Evaluating the Content of a Text")

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see pg. 17, E4 – in 12 of 12 states analyzed)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Fostering Habits of Mind Essential for Success bullet 5)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see III.B.7*)
- A counterpart of this standard appears in the English language arts standards from the following states:

1. **California:** *English-Language Arts Content Standards for California Public Schools* (see Reading 2.8, grades 9-10; Reading 2.0 and 2.6, grades 11-12)
2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see 8.31 and 8.34, and 13.24, 13.26; and General Standard 13: Nonfiction)

- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009.* Washington, DC: National Assessment Governing Board. (see Proficient bullet 5 and Advanced bullets 1, 3 and 5 – Informational, see "Critique and Evaluate")

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Reading 15. Analyze how two or more texts with different styles, points of view, or arguments address similar topics or themes.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices.* New York, NY: College Entrance Examination Board (see pg. 7- skills rated by importance to post-secondary instructors- skill #19 "Comparing and contrasting two texts")
- ACT. (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skill #25).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).
- *AP European and World History Course Descriptions* (2009), New York, NY: College board (see pgs. 21-24 in AP European History for document-based question expectations). AP World and U.S. History also have these expectations.
- *Florida American Diploma Project Survey Results.* (see row 23. Survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

1. **Ireland:** *Leaving Certificate/English Syllabus* for Higher Level and Ordinary Level (≈ Grades 10-11) (see 5.5.d, Ordinary; 4.4.1.f and 5.4.d, Higher)
2. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see Outcome 2; C-2, 2.1, 2.2, 2.3, Preliminary; C-1.1, C-2, 2.1, 2.2, 2.3, HSC)
3. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.6, Grade 12 Oral Communication)

- A counterpart of this standard also appears in the English language arts standards of the following :

1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.2.m and 2.2.n, 1.4.b)

- Organization for Economic Cooperation and Development. (2003). *The PISA 2003 Assessment Framework: Mathematics, Reading, Science and Problem Solving Knowledge and Skills.* Paris, France: Organization for Economic Cooperation and Development. (pg. 115, "Developing an Interpretation")

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Making the Reading/Writing Connection bullet 4)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see I.C.5)
- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California:** *English-Language Arts Content Standards for California Public Schools* (see 3.5, Reading Comprehension grades 9-10, 2.4.b Writing Applications Grades 11-12)
    2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see 10.5, 11.7, 15.10)

- U.S. Dept. of Education. (2009). *Reading Framework for the National Assessment of Educational Progress 2009.* Washington, DC: National Assessment Governing Board. (see Advanced - Literary bullet 4, see "Multiple Texts", see"Integrate and Interpret")

Reading 16. Draw upon relevant prior knowledge to enhance comprehension, and note when the text expands on or challenges that knowledge.

College Readiness

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Alberta, Canada:** *English Language Arts Curriculum Outcomes*, 2003 (Grades 10-12) (see 10/20/30.2.1.3.a , 20.2.1.3.a, 30.2.1.3.b, 30.3.2.3.a, 10/20/30.2.1.1.d)
    2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package, Prescribed Learning Outcomes*, 2007 (Grade 12) (see B5)
    3. **Ontario, Canada:** *The Ontario Curriculum*, English, 2007 (see 1.2 and 1.5 Grade 12 Reading & Literature Studies)

- A counterpart of this standard also appears in the English language arts standards of the following :

    1. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 7.e, 8.1.d and 8.2.e)

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Making the Reading/Writing Connection bullet 3)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Reading 17. Apply knowledge and concepts gained through reading to build a more coherent understanding of a subject, inform reading of additional texts, and to solve problems.

College Readiness

- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pgs. 51-54, and sample exam expectations for literature beginning on 56).
- *AP European and World History Course Descriptions* (2009), New York, NY: College board (see pgs. 21-24 in AP European History for document-based question expectations). AP World and U.S. History also have these expectations.
- ACT. (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 44-45, these data have been re-sorted to clarify which skills are most important to post-secondary instructors, see skill #9, #22, #23, #25).

Career Readiness

- ACT. (2006). *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: ACT. (pgs. 3-5, see Table 2, "Sequential, Comparative, and Cause-Effect Relationships," WorkKeys Column, Points 1 and 2)
- ACT (2009) See ACT WorkKeys "Reading for Information" Level 5 requirements (Level 5 is workplace training and college ready).
- *The American Diploma Project Workplace Study*. (2002). Washington, DC: National Alliance of Business. (See point 1, page 12; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.6, Grade 12 Oral Communication)

- A counterpart of this standard also appears in the English language arts standards of the following :

    1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.2.e)
    2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 9.2.f)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. (see pg. 17, E8– in 10 of 12 states analyzed)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California:** *English-Language Arts Content Standards for California Public Schools* (2.3, Reading Comprehension Grades 11-12)

Reading 18. Demonstrate facility with the specific reading demands of texts drawn from different disciplines, including history, literature, science, and mathematics.

Disciplinary Literacy Research

The following are a few seminal works of research on disciplinary literacy, which is at the heart of this standard. The sources below cannot be categorized as college or career readiness materials or evidence from a set of standards. Rather, it is general research that provides insight into the field of disciplinary literacy.

- Carnegie Council on Advancing Adolescent Literacy. (2010). *Time to act: An agenda for advancing adolescent literacy for college and career success*. New York, NY: Carnegie Corporation of New York.
- Fang, Z., & Schleppegrell, M. J. (2008). *Reading in secondary content areas*. Ann Arbor: University of Michigan Press.
- Lee, C.D., Spratley, A. (2010). *Reading in the disciplines: The challenges of adolescent literacy*. New York, NY: Carnegie Corporation of New York.
- Moje, E. B., Young, J. P., Readence, J. E., & Moore, D. W. (2000). Reinventing adolescent literacy for new times: Perennial and millennial issues. *Journal of Adolescent and Adult Literacy, 43*, 400–410.
- Schleppegrell, M. J. (2004). *The language of schooling: A functional linguistics perspective*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Shanahan, T., & Shanahan, C. (2008). Teaching disciplinary literacy to adolescents: Rethinking content-area literacy. *Harvard Educational Review, 78*, 40–59.

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Writing Evidence

Writing 1. Establish and refine a topic or thesis that addresses the specific task and audience.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #12, #37).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008). New York, NY: College Board (see pg. 11 for course expectations).
- *AP European History Course Description* (2009). New York, NY: College board (see pp. 21-24 for document-based question expectations). AP World and US History also have these expectations.
- Conley, D. (2003) *Understanding University Success: English Work Samples*. Eugene, OR: Center for Educational Policy Research.
- ACT (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #15, #23).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis*. (see Research 1 and Writing 3; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results*. (see rows 5 and 12; survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

- *The American Diploma Project Workplace Study*. (2002). Washington, DC: National Alliance of Business. (see point *b* on pg. 24; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 30.3.1.1.a and 10/20/30.3.1.1.c)
    2. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 5.0.3 and AI 8.CC.3)
    3. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.1 and 1.2, Grade 12 Writing)

- A counterpart of this standard also appears in the English language arts standards of the following:

1. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 4.b)

Illustrative Alignment with State and Other Standards

- *Intersegmental Committee of the Academic Senates (ICAS).* (2002) Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities. (see Writing Competencies, Invention, bullet 4)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see II.E.1 & III.A.1)
- A counterpart of this standard appears in the English language arts standards from the following states:

1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (1.0, Writing Strategies Grades 11-12)
2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 19: Writing, 19.26, 19.27, 19.30)

Writing 2. Gather the information needed to build an argument, provide an explanation, or address a research question.

College Readiness

- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (See Research 2; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results.* (see row 10; survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (see pgs. 22-25; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 10/20/30.3.2.1.b)
2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see C6)
3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 2.O.4 and AI 2.CC.3; AI 5.O.3)
4. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see C-10.3, HSC)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.3, Grade 12 Writing)

- A counterpart of this standard also appears in the English language arts standards of the following:

1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.3.h)

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Making the Reading/Writing Connection, bullet 6)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see III.B.1 and IIIA.2, III.B)

Writing 3. Sustain focus on a specific topic or argument.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices.* New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #3, #12).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).
- ACT (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skill #15).

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 10/20/30.4.1.3.c and 20.4.1.3.e; 20/30.4.2.1.a; 10/20.4.2.2.d)
2. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 8.O.2)
3. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 4, Outcome 1, Key Skill 1)

- A counterpart of this standard also appears in the English language arts standards of the following:

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.3.d-e)
  2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 4.b; 4.e; 5.b)

Illustrative Alignment with State and Other Standards

- U.S. Dept. of Education. (2007). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (see Holistic Scoring Guides Level 6 "To Persuade"; "To Explain"; "To Convey Experience")
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (see 1.3, Writing Strategies Grades 11-12)
  2. **Massachusetts**, *English Language Arts Curriculum Framework*, June 2001. (see General Standard 19: Writing, 19.26, 19.27, 19.30)

Writing 4. Support and illustrate arguments and explanations with relevant details, examples, and evidence.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #2, #3, #4).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).
- ACT (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skill #3).

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 30.4.1.3.e and 20/30.4.1.3.g)
  2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see C7; C8)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

  3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see A1.2.CC.3)
  4. **Hong Kong:** *English Language Curriculum and Assessment Guide, 2007*. (≈Grades 10-11) (see bullet 4, Writing)
  5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.4 & 1.5, Grade 12 Writing)
  6. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 1, Outcome 2, Key Skill 3; Unit 4, Outcome 1, Key Skill 1)

- A counterpart of this standard also appears in the English language arts standards of the following:

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.3.b)
  2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 4.b-c and 5.c; 9.1.d)

Illustrative Alignment with State and Other Standards

- U.S. Dept. of Education. (2011). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (see Proficient Achievement Level, Grade 12, box 3, Holistic Scoring Guides Level 6 "to Persuade"; "To Explain"; "To Convey Experience")
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Writing Competencies, Arrangement, bullet 1: Fostering Habits of Mind Essential for Success, bullet 16)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.E.2 and IV.B.2)
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** English-Language Arts Content Standards for California Public Schools, 1997. (see 1.3, Writing Strategies Grades 11-12)
  2. **Massachusetts**, English Language Arts Curriculum Framework, June 2001. (see General Standard 19: Writing, 19.26, 19.27, 19.30)

Writing 5. Create a logical progression of ideas or events, and convey the relationships among them.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #3, #7, #9, #21, #26).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- Conley, D. (2003) *Understanding University Success: English Work Samples.* Eugene, OR: Center for Educational Policy Research.
- ACT (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #4, #9, #12, #17, #19, #22, #29, #30).

Career Readiness

- ACT (2009) See ACT WorkKeys Writing Level 3 requirements (Level 3 is workplace training and college ready).

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 10/20/30.3.2.1.d; 20/30.4.2.2.b; 10/20.4.2.2.d-e)
    2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see C6; C13)
    3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 5.0.3; AI 8.0.2; AI 8.CC.3)
    4. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see bullets 1-3 and 8-9, Writing; bullet 2, Senior Secondary)
    5. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see 9.2 Preliminary)
    6. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.4, 2.6, Grade 12 Writing)
    7. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 2, Outcome 2, Key Skill 5)

- A counterpart of this standard also appears in the English language arts standards of the following:

    1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.3.c; 2.3.e-f)
    2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (See 4.a-b; 4.e-f; 5.b; 5.g)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see C3 - in 12 of 12 states analyzed)
- U.S. Dept. of Education. (2011). *Writing Framework for the 2011 National Assessment of Educational Progress.* Washington, DC: National Assessment Governing Board. (see Advanced Achievement Level, Grade 12, box three, Holistic Scoring Guides Level 6 "to Persuade"; "To Explain"; "To Convey Experience")

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Writing Competencies, Arrangement, bullets 3 and 4)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see II.D.2 and II.D.4, II.F.2)
- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California**: *English-Language Arts Content Standards for California Public Schools*, 1997. (See 1.3, Writing Strategies Grades 11-12)
    2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 19: Writing, 19.26, 19.27, 19.30; General Standard 23: Organizing Ideas in Writing, 23.13, 23.14, 23.15)

Writing 6. Choose words and phrases to express ideas precisely and concisely.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices.* New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #5, #27).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).
- ACT (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skill #28).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (see Language 6 and Writing 2; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 20/30.4.2.3.b)
    2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grades 11-12) (see C12)
    3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 2.CC.1, AI 5.CC.3)
    4. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see bullet 9, Writing; point 5, Senior Secondary)

5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 2.3, Grade 12 Writing)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see C2- in 12 of 12 states analyzed)
- U.S. Dept. of Education. (2011). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (see Advanced Achievement Level, Grade 12, box 5; Holistic Scoring Guides Level 6 "to Persuade"; "To Explain"; "To Convey Experience")
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (Writing Competencies, Style/Expression, bullet 1)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.D.5 & II.E.5)
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (see 1.5, Writing Strategies Grades 11-12)
  2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 21: Revising, 21.8, 21.9)

Writing 7. Use varied sentence structures to engage the reader and achieve cohesion between sentences.

College Readiness

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 20/30.4.2.3.c; 20/30.4.2.4.f)
  2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see C12)
  3. **Ireland:** *Leaving Certificate/English Syllabus* for Higher Level and Ordinary Level (≈ Grades 10-11) (see 5.3)
  4. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 2.4, Grade 12 Writing)

- A counterpart of this standard also appears in the English language arts standards of the following:

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.3.g, 2.3.m)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Illustrative Alignment with State and Other Standards

- U.S. Dept. of Education. (2007). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (see Holistic Scoring Guides Level 6, bullet 4 "to Persuade"; "To Explain"; "To Convey Experience"; Advanced Achievement Level, Grade 12, box four)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Writing Competencies, Style/Expression, bullet 1)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.D.2)
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (see 1.1, Written and Oral Language Conventions Grades 11-12)
  2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see 19.26, 19.27)

Writing 8. Develop and maintain a style and tone appropriate to the task, purpose, and audience.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #3, #12, #23, #37).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008). New York, NY: College Board (see pg. 11 for course expectations).
- ACT (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #15, #20).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis*. (see Writing 2 and 5; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results*. (see rows 22 and 26; survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

- *Hawai'i Career Ready Study*. (2007). Commissioned by the Hawai'i P-20 Initiative. (see pgs. 36-38 sample task "Draft memo to all employees," Hotel/Guest Services Manager)
- ACT (2009) See ACT WorkKeys Writing Level 3 requirements (Level 3 is workplace training and college ready).

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 20.4.1.1.c; 10/20/30.4.2.3.a and 20.4.2.3.d)
  2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grades 11-12) (see C12)
  3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 2.CC.1; AI 5.O.3; AI 8.CC.3)
  4. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (See bullets 9 and 12, Writing)
  5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 2.2, Grade 12 Writing)
  6. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 1, Outcome 2, Key Knowledge 4; Unit 3, Outcome 2, Key Knowledge 1)

- A counterpart of this standard also appears in the English language arts standards of the following :

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.3.b)
  2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 5.e and 5.g)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up*. (2008). Washington, DC: Achieve. 2008. (see C2 - in 12 of 12 states analyzed)
- U.S. Dept. of Education. (2011). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (see Advanced Achievement Level, Grade 12, box 6; Holistic Scoring Guides Level 6, bullet 4 "to Persuade"; "To Explain"; "To Convey Experience")
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Writing Competencies, Invention, bullet 2)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.E.4-6 and II.D.6")
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (see 1.2, 1.5, and 1.9, Writing Strategies Grades 11-12)
  2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 21: Revising, 21.8, 21.9)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Writing 9. Demonstrate command of the conventions of standard written English, including grammar, usage, and mechanics.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #6, #8, #11, #13, #16, #18, #19, #20, #25, #26, #28, #31, #32, #34, #39, #40, #41, #43, #44).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).
- Conley, D. (2003) *Understanding University Success: English Work Samples*. Eugene, OR: Center for Educational Policy Research.
- ACT (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #2, #5, #6, #7, #8, #10, #11, #14, #16, #18, #20, #21, #24, #25, #26, #28).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis*. (see Language 1; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results*. (see row 3; survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

- *Hawai'i Career Ready Study*. (2007). Commissioned by the Hawai'i P-20 Initiative. (see pgs. 22-24 sample task "Pass entrance exams for apprenticeship." Military/Navy Shipyard Apprenticeship)
- *The American Diploma Project Workplace Study*. (2002). Washington, DC: National Alliance of Business. (see top half, pg. 10; pg. 17; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)
- ACT (2009) See ACT WorkKeys Writing Level 3 requirements (Level 3 is workplace training and college ready).

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 4.2.4.b-g)
  2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grades 11-12) (see C14)
  3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see AI 8.C.4)
  4. **Ireland:** *Leaving Certificate/English Syllabus* for Higher Level and Ordinary Level (≈ Grades 10-11) (see 5.3)

5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 3.3 and 3.4, Grade 12 Writing)
6. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 1, Outcome 1, Key Skill 7)

- A counterpart of this standard also appears in the English language arts standards of the following:

1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 1.1.c; 2.3.n-o)
2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 5.d; 6.c)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up*. (2008). Washington, DC: Achieve. 2008. (see A1 - in 12 of 12 states analyzed)
- U.S. Dept. of Education. (2011). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (see Advanced Achievement Level, Grade 12, box 7; Holistic Scoring Guides Level 6, bullet 4 "to Persuade"; "To Explain"; "To Convey Experience")
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Writing Competencies, Style/Expression, bullet 2)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.A & II.B)
- A counterpart of this standard appears in the English language arts standards from the following states:

1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (see 1.1 and 1.2, Written and Oral English Language Conventions Grades 11-12)
2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. see 5.28, 5.30; 21.8; General Standard 22: Standard English Conventions, 22.9, 22.10)

Writing 10. Represent and cite accurately the data, conclusions, and opinions of others, effectively incorporating them into one's own work while avoiding plagiarism.

College Readiness

- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).
- *AP European History Course Description* (2009), New York, NY: College board (see pp. 21-24 for document-based question expectations). AP World and US History also have these expectations.
- ACT (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skill #13).

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis*. (see Writing 6; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results*. (See row 21; survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

- *The American Diploma Project Workplace Study*. (2002). Washington, DC: National Alliance of Business. (see point 4 on pg. 25; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 3.2.1.c; 3.2.1.e)
2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see C14)
3. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (1.3, Grade 12 Writing)
4. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 3, Outcome 3, Key Skill 5)

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Writing Competencies, "Students will be assigned writing tasks…," bullet 14; Technology Competencies, bullet 8)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.D.7; III.B.4; III.B.6)
- A counterpart of this standard appears in the English language arts standards from the following states:

1. **California**: *English-Language Arts Content Standards for California Public Schools*, 1997. (See 1.7, Writing Strategies Grades 9-10)
2. **Massachusetts**, *English Language Arts Curriculum Framework*, June 2001. (see 24.5)

Writing 11. Assess the quality of one's own writing, and, when necessary, strengthen it through revision.

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #7, #12, #16, #24, #33, #37).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).
- ACT (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skill #15).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis*. (see Writing 4 and 5; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results*. (see rows 16 and 22; survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 20/30.4.2.1.a-d; 30.4.2.2.a, 20/30.4.2.2.b-c, 10/20.4.2.2.d-e)
  2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see C7)
  3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (AI 2.O.2; AI 2.CC.3; AI 5.O.3; AI 8.CC.3)
  4. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see bullet 7, Writing; see Senior Secondary, bullet 2)
  5. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see C-12.1-12.4, Preliminary)
  6. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 2.7, Grade 12 Writing)
  7. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 1, Outcome 1, Key Skill 5; Unit 1, Outcomes 2, Key Knowledge 4; Unit 1, Outcome 3, Key Skill 3)

- A counterpart of this standard also appears in the English language arts standards of the following :

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.3.b; 4.3.e)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

  2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 5.f)

Illustrative Alignment with State and Other Standards

- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.F)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Writing Competencies, Arrangement, bullet 6 and Style/Expression, bullet 2)
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (See 1.9, Writing Strategies Grades 9-12)
  2. **Massachusetts**, *English Language Arts Curriculum Framework*, June 2001. (see General Standard 21: Revising, 21.8, 21.9)

Writing 12. Use technology as a tool to produce, edit, and distribute writing.

College Readiness

Career Readiness

- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis*. (See Writing 8; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Information Technology, Senior Secondary, bullet 4)
  2. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see C-9.1, HSC)
  3. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 3.5-3.6, Grade 12 Writing)

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Technology Competencies, bullets 1-2)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Writing 13. Synthesize information from multiple relevant sources, including graphics and quantitative information when appropriate, to provide an accurate picture of that information.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices.* New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #2, #5, #15, #29).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).
- *AP European History Course Description* (2009), New York, NY: College board (see pp. 21-24 for document-based question expectations). AP World and US History also have these expectations.
- Conley, D. (2003) *Understanding University Success: English Work Samples.* Eugene, OR: Center for Educational Policy Research.
- ACT (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #3).
- *Florida American Diploma Project Survey Results.* (see row 24; survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

- *Hawai'i Career Ready Study.* (2007). Commissioned by the Hawai'i P-20 Initiative. (See pgs. 18-19 sample task "Review claim letter," Insurance/Claims Agent)
- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (see pgs. 22-23; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 30.3.2.3.a)
  2. **British Columbia, Canada:** English Language Arts Integrated Resource Package, Prescribed Learning Outcomes, 2007 (Grade 12) (see C8 and C10)
  3. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see bullet 2, Writing; Information Technology Skills, Senior Secondary 1;Study Skills, Senior Secondary, bullet 1)
  4. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see 10.1, Preliminary; Outcome 7, HSC)
  5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.3, Grade 12 Writing)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- A counterpart of this standard also appears in the English language arts standards of the following:

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.2.e)
  2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 9.1.b)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see F7 - in 12 of 12 states analyzed)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Fostering Habits of Mind Essential for Success, bullet 4; Writing Competencies, "Students will be assigned writing tasks...," bullet 5)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success.* Eugene, OR: Center for Educational Policy Research. (see II.E.8*, and III.B.6)
- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (see 2.3, Writing Applications Grades 9-10, 1.4, Writing Strategies Grades 11-12; 2.4.a-d, Writing Applications Grades 11-12)

Writing 14. Convey complex information clearly and coherently to the audience through purposeful selection and organization of content.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices.* New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #2, #5, #12, #15, #29, #37).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).
- ACT (2006). *ACT National Curriculum Survey 2005-2006.* Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #3, #4, #12, #15).

Career Readiness

- ACT (2009) See ACT WorkKeys Writing Level 3 requirements (Level 3 is workplace training and college ready).
- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (see point 2 on pg. 19; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 10/20/30.3.2.1.d)
    2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see C4)
    3. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see "Work with others", dash 1, Language Development)
    4. **Ireland:** *Leaving Certificate/English Syllabus for Higher Level and Ordinary Level* (≈ Grades 10-11) (see 5.5.e, Ordinary Level; 5.4.e, Higher Level)
    5. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see Outcome 7, HSC; 10.3, Preliminary)
    6. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.4 & 2.1, Grade 12 Writing)

- A counterpart of this standard also appears in the English language arts standards of the following:

    1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 1.1.a; 2.3.c)
    2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 9.1.b)

Illustrative Alignment with State and Other Standards

- U.S. Dept. of Education. (2011). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (see Holistic Scoring Guide for "To Explain" Level 6)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Writing Competencies, Invention, bullet 2; Arrangement, bullets 3 & 4)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.E.8*, II.D.2, II.D.4)
- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (see 2.3 and 2.6.a, Writing Applications Grades 9-10)
    2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 19: Writing, 19.26, 19.30)

Writing 15. Demonstrate understanding of content by reporting facts accurately and anticipating reader misconceptions.

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #2, #5, #12, #15, #29, #37).
- ACT (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #3, #15).

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1.**British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see C2; C4)

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Writing Competencies, "Students will be assigned writing tasks…." bullets 6 & 7)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.E.8*)
- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California**: *English-Language Arts Content Standards for California Public Schools*, 1997. (see 2.3 & 2.6.d, Writing Applications Grades 9-10)

Writing 16. Establish a substantive claim, distinguishing it from alternate or opposing claims.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #4, #5, #10, #12, #14, #29).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- *AP European History Course Description* (2009), New York, NY: College board (see pp. 21-24 for document-based question expectations). AP World and US History also have these expectations.
- ACT (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #23).
- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis*. (see Logic 9; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results*. (see row 7; survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

- *The American Diploma Project Workplace Study*. (2002). Washington, DC: National Alliance of Business. (see point #3 on pg. 21; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **British Columbia, Canada:** English Language Arts Integrated Resource Package, Prescribed Learning Outcomes, 2007 (Grade 12) (see A2, C2, C4)
  2. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see A1 4.CC.3-5)
  3. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see bullets 3 and 11, Writing, see Communication Skills, Senior Secondary, bullet 2)
  4. **Ireland:** *Leaving Certificate/English Syllabus for Higher Level and Ordinary Level* (≈ Grades 10-11) (see 4.2.2.a-b; 5.4.e. Higher Level)
  5. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see 6.2. HSC)
  6. **Victoria, Australia**: *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 3, Outcome 3, Key Knowledge 4 & Skill 3)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up*. (2008). Washington, DC: Achieve. 2008. (see E9 - in 11 of 12 states analyzed)
- U.S. Dept. of Education. (2011). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (see Holistic Scoring Guide for "To Persuade" Level 6)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.E.2)
- A counterpart of this standard appears in the English language arts standards from the following states:

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (see 2.4. Writing Applications Grades 9-10)
2. **Massachusetts**, *English Language Arts Curriculum Framework*, June 2001. (see 19.30)

Writing 17. Link claims and evidence with clear reasons, and ensure that the evidence is relevant and sufficient to support the claims.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #4, #5, #10, #14, #29, #30).
- *AP English Language and Composition and English Literature and Composition Course Description* (2008), New York, NY: College Board (see pg. 11 for course expectations).
- *AP European History Course Description* (2009), New York, NY: College board (see pp. 21-24 for document-based question expectations). AP World and US History also have these expectations.
- Conley, D. (2003) *Understanding University Success: English Work Samples*. Eugene, OR: Center for Educational Policy Research.
- ACT (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #1, #3, #4, #12, #15).

Career Readiness

- *The American Diploma Project Workplace Study*. (2002). Washington, DC: National Alliance of Business. (see F3, pg. 21; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 20.4.1.3.f; 20/30.4.2.1.c)
  2. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see 6.2. HSC; 10.2 and 10.3. HSC)
  3. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.4 and 1.5, Grade 12 Writing)
  4. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 1, Outcome 2, Key Skill 3; Unit 4, Outcome 2, Key Skills 2-3; Unit 3, Outcome 3, Key Knowledge 4 & Skill 3)

- A counterpart of this standard also appears in the English language arts standards of the following:

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.3.h-i)
2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 9.1.d)

Illustrative Alignment with State and Other Standards

- U.S. Dept. of Education. (2011). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (see Holistic Scoring Guide for "To Persuade" Level 6)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Fostering Habits of Mind Essential for Success, bullet 16)
- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.E.2; II.E.3; IV.B.2)
- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California:** *English-Language Arts Content Standards for California Public Schools*, 1997. (see Writing Applications Grades 9-10; 2.2.c and 2.4.a-e, Writing Applications Grades 11-12; 1.3)
    2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 19: Writing, 19.26, 19.30)

Writing 18. Acknowledge competing arguments or information, defending or qualifying the initial claim as appropriate.

College Readiness

- Milewski, G.B., Johnsen, D., Glazer, N., & Kubota, M. (2005). *A Survey to Evaluate the Alignment of the New SAT® Writing and Critical Reading Sections to Curricula and Instructional Practices*. New York, NY: College Board (see pgs. 10 and 12, these data have been sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #4, #5, #10, #12, #14, #29).
- *AP European History Course Description* (2009), New York, NY: College board (see pp. 21-24 for document-based question expectations). AP World and US History also have these expectations.
- ACT (2006). *ACT National Curriculum Survey 2005-2006*. Iowa City, IA: ACT. (pgs. 39-40, these data have been re-sorted by importance to clarify which skills are most important to post-secondary instructors, see skills #15).

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

    1. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see B9)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

2. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see "Plan...", dash five, Language Development)
3. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 3, Outcome 2, Key Skill 3)

Illustrative Alignment with State and Other Standards

- Conley, D.T. (2003) *Understanding University Success: A Report from Standards for Success*. Eugene, OR: Center for Educational Policy Research. (see II.E.4)
- U.S. Dept. of Education. (2011). *Writing Framework for the 2011 National Assessment of Educational Progress*. Washington, DC: National Assessment Governing Board. (see Holistic Scoring Guide for "To Persuade" Level 6)

- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **California**: *English-Language Arts Content Standards for California Public Schools*, 1997. (see 2.4, Writing Applications Grades 9-10)
    2. **Massachusetts**, *English Language Arts Curriculum Framework*, June 2001. (see 19.30)

2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 4.b and 4.e)

Illustrative Alignment with State and Other Standards

- A counterpart of this standard appears in the English language arts standards from the following states:

1. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 2, 2.5)
2. **Texas:** *Texas College Readiness Standards*, (2008). (see pg. 4-5, Speaking, B.3)

Speaking 3. Make strategic use of multimedia elements and visual displays of data to gain audience attention and enhance understanding.

College Readiness

Career Readiness

- *Missouri Career Prep Certificate Program Planning Guide*, Missouri Department of Elementary and Secondary Education. (see pg. A5, Communication: Written, Verbal, and Listening, Performance skill 4)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 10.4.1.4.b, 20.4.1.4.b and 10/20/30.4.1.4.c)
2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see A6)
3. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Information Technology, Senior Secondary, bullets 3-5)
4. **New South Wales, Australia:** *English Stage 6 Syllabus*, 1999 (Grades 11-12) (see C-5, 5.3, Preliminary)
5. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 2.7, Grade 12 Oral Communication; 3.4, Grade 12 Media Studies)
6. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 1, Outcome 2, Key Skills 1 and 4; Unit 2, Outcome 3, Key Knowledge 5 and Key Skill 3)

- A counterpart of this standard also appears in the English language arts standards of the following:
  1. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 4.a, 4.c)

Illustrative Alignment with State and Other Standards

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up*. (2008). Washington, DC: Achieve. 2008. (see E4, in 12 of 12 states analyzed)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Fostering Habits of Mind Essential for Success, bullet 5; Listening and Speaking Competencies in Academic Settings, bullet 2)
- A counterpart of this standard appears in the English language arts standards from the following states:

1. **California:** *English-Language Arts Content Standards for California Public Schools*. (see 2.6, Grades 11-12; 2.4, Grades 11-12)
2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 27: Media Production, 27.6)

Speaking 4. Demonstrate command of formal Standard English when appropriate to task and audience.

College Readiness

- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis*. (see Language 1; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results*. (see row 3; survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

- *The American Diploma Project Workplace Study*. (2002). Washington, DC: National Alliance of Business. (see pgs. 16-17, 19); data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

1. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see A12)
2. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Speaking, "Present Information..." bullet 4)
3. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 3, Outcome 1, Key Skill 6)

- A counterpart of this standard also appears in the English language arts standards of the following:

1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.1.a)
2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 3.e)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Speaking & Listening Evidence

Speaking 1. Select and use a format, organization, and style appropriate to the topic, purpose, and audience.

College Readiness

Career Readiness

- *The American Diploma Project Workplace Study*. (2002). Washington, DC: National Alliance of Business. (See pg. 19; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)
- Qualifications and Curriculum Authority. (2007). *Functional Skills and Standards*. (see pg. 12, Speaking and Listening Level 2, bullet 3)
- *Missouri Career Prep Certificate Program Planning Guide*, Missouri Department of Elementary and Secondary Education. (see pg. A5, Communication: Written, Verbal, and Listening, Knowledge skill 2)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** *English Language Arts Curriculum Outcomes*, 2003 (Grades 10-12) (see 10.4.1.4.b, 10/20/30.4.1.4.c)
  2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package, Prescribed Learning Outcomes*, 2007 (Grade 12) (see A6, A12)
  3. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Speaking, bullets 1, 4, and 5)
  4. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 2.1 - 2.6, Grade 12 Oral Communication)
  5. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 3, Outcome 1, Key Skills 6-7)

- A counterpart of this standard also appears in the English language arts standards of the following :

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.1.a-c)
  2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 3.a-f, 4.a-f)

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. (see Fostering Habits of Mind Essential for Success, bullet 7; Speaking, bullets 1-4)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- A counterpart of this standard appears in the English language arts standards from the following states:

  1. **California:** *English-Language Arts Content Standards for California Public Schools*. (see 1.3, Grades 9-10; 1.8-1.10, Grades 11-12)
  2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see General Standard 3: Oral Presentation, 3.17)
  3. **Texas:** *Texas College Readiness Standards*, (2008). (see pg. 4-5, Speaking, A.1-2)

Speaking 2. Present information, findings, and supporting evidence clearly and concisely.

College Readiness

Career Readiness

- *The American Diploma Project Workplace Study*. (2002). Washington, DC: National Alliance of Business. (See pg. 19; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)
- Casner-Lotto, J., Rosenblum, E., and Wright, M., *The Ill-Prepared Workforce*. (2009). The Conference Board. (see pg. 22, Oral Communications)
- Qualifications and Curriculum Authority. (2007). *Functional Skills and Standards*. (see pg. 12, Speaking and Listening Level 2, bullet 2)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **British Columbia, Canada:** *English Language Arts Integrated Resource Package, Prescribed Learning Outcomes*, 2007 (Grade 12) (see A8, A9)
  2. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see A1 4.0.2)
  3. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Speaking, bullets 1-2)
  4. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 2.3, Grade 12 Oral Communication)
  5. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 2, Outcome 3, Key Knowledge, bullet 5)

- A counterpart of this standard also appears in the English language arts standards of the following :

  1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (2.1.b)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see A1, in 12 of 12 states analyzed)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Fostering Habits of Mind Essential for Success, bullet 5; Listening and Speaking Competencies in Academic Settings, bullet 2)

Speaking 5. Listen to complex information, and discern the main ideas, the significant details, and the relationships among them.

College Readiness

- *Virginia Postsecondary Outreach Campaign and Data Collection, Essential English Skills Analysis.* (See Communication 2 and 3; survey of multi-disciplinary faculty teams at 30 higher education institutions; included if average rating is at least 7.5 on a scale of 10)
- *Florida American Diploma Project Survey Results.* (See rows 11 and 27; survey of faculty members at 18 public higher education institutions; included if average rating is at least 7.5 on a scale of 10)

Career Readiness

- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (See point 1, pg. 18; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)
- *Missouri Career Prep Certificate Program Planning Guide,* Missouri Department of Elementary and Secondary Education. (see pg. A5, Communication: Written, Verbal, and Listening, Knowledge skill 3 and Performance skill 5)
- Qualifications and Curriculum Authority. (2007). *Functional Skills and Standards.* (see pg. 12, Speaking and Listening Level 2, bullet 1)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** English Language Arts Curriculum Outcomes, 2003 (Grades 10-12) (see 10/20.2.1.2.b)
  2. **British Columbia, Canada:** English Language Arts Integrated Resource Package, Prescribed Learning Outcomes, 2007 (Grade 12) (see A3, A7, A8)
  3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see A1.1.CC.3 and 1.CC.5)
  4. **Hong Kong:** *English Language Curriculum and Assessment Guide,* 2007. (≈Grades 10-11) (see Listening, bullets 1 and 2)
  5. **Ireland:** *Leaving Certificate/English Syllabus for Higher Level and Ordinary Level* (≈ Grades 10-11) (see 4.1.1.a, 4.1.1.c)

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

  6. **Ontario, Canada:** *The Ontario Curriculum, English,* 2007 (Grades 11-12) (see 1.4-1.6, Grade 12 Oral Communication)

- A counterpart of this standard also appears in the English language arts standards of the following :

  1. **England:** English Programme of Study for Key stage 4, 2005 (≈ Grades 10-11) (see 2.1.f)
  2. **Singapore:** English Language Syllabus 2001, Learning Outcomes for O-Levels (≈ Grades 10-11) (See 2.c, 2.e, 3.3.a-c)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see B4, in 11 of 12 states analyzed)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (Listening, bullet 2)
- A counterpart of this standard appears in the English language arts standards from the following states: S

  1. **Massachusetts:** *English Language Arts Curriculum Framework,* June 2001. (see General Standard 2, 2.5)
  2. **Texas:** *Texas College Readiness Standards,* (2008). (see pg. 4-5, Listening, A.2-3, B.1-3)

Speaking 6. Follow the progression of the speaker's message, and evaluate the speaker's point of view, reasoning, and use of evidence and rhetoric.

College Readiness

Career Readiness

- *The American Diploma Project Workplace Study.* (2002). Washington, DC: National Alliance of Business. (See point 2, pg. 18; data gathered through employer feedback from 21 organizations in eight states representing over 10 industries)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

  1. **Alberta, Canada:** *English Language Arts Curriculum Outcomes,* 2003 (Grades 10-12) (see 30.2.2.2.f, 30.3.2.2.a-d)
  2. **British Columbia, Canada:** *English Language Arts Integrated Resource Package, Prescribed Learning Outcomes,* 2007 (Grade 12) (see A9)

3. **Finland:** *National Core Curriculum for Upper Secondary Schools* for Mother Tongue and Literature, Finnish as the mother tongue, 2003 (≈ Grades 10-12) (see A1 2.0.1, A1 7.0.3)
4. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Listening, bullets 6-7; Critical Thinking Skills, number 2 and bullets 1-4)
5. **Ireland:** *Leaving Certificate/English Syllabus for Higher Level and Ordinary Level* (≈ Grades 10-11) (see 4.1.1.d-f, 4.2.1.a-g, 4.3.1.a)
6. **Ontario, Canada:** *The Ontario Curriculum, English*, 2007 (Grades 11-12) (see 1.7 & 1.8, Grade 12 Oral Communication)
7. **Victoria, Australia:** *Victorian Certificate of Education Study Design: English/English as a Second Language*, 2007 (≈ Grades 11-12) (see Unit 2, Outcome 3, Key Skill bullets 1 and 2)

- A counterpart of this standard also appears in the English language arts standards of the following :

1. **England:** *English Programme of Study* for Key stage 4, 2005 (≈ Grades 10-11) (see 1.4.c-d, 2.1.g)
2. **Singapore:** *English Language Syllabus 2001*, Learning Outcomes for O-Levels (≈ Grades 10-11) (see 9.2.c, 9.3.b)

Illustrative Alignment with State and Other Standards

- *Out of Many, One: Towards Rigorous Common Core Standards from the Ground Up.* (2008). Washington, DC: Achieve. 2008. (see E4, in 12 of 12 states analyzed)
- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Fostering Habits of Mind Essential for Success, bullet 5; Listening and Speaking, Listening, bullet 2)
- A counterpart of this standard appears in the English language arts standards from the following states:

1. **California:** *English-Language Arts Content Standards for California Public Schools.* (see 1.12, 1.13, Grades 9-10)
2. **Massachusetts:** *English Language Arts Curriculum Framework*, June 2001. (see 3.15)
3. **Texas:** *Texas College Readiness Standards*, (2008). (see pg. 4-5, Listening, A.1-3)

Speaking 7. Ask relevant questions to clarify points and challenge ideas.

College Readiness

Career Readiness

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

1. **British Columbia, Canada:** *English Language Arts Integrated Resource Package*, Prescribed Learning Outcomes, 2007 (Grade 12) (see A7)

- A counterpart of this standard also appears in the English language arts standards of the following :

1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.1.e)

Illustrative Alignment with State and Other Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Fostering Habits of Mind Essential for Success, bullet 7; Listening and Speaking, Speaking, bullets 1 and 3)
- A counterpart of this standard appears in the English language arts standards from the following states:

Massachusetts: *English Language Arts Curriculum Framework*, June 2001. (see General Standard 2: Questioning, Listening, and Contributing)

Speaking 8. Respond constructively to advance a discussion and build on the input of others.

College Readiness

Career Readiness

- *Missouri Career Prep Certificate Program Planning Guide*, Missouri Department of Elementary and Secondary Education. (see pg. A5, Communication: Written, Verbal, and Listening-Performance skill 2)
- Qualifications and Curriculum Authority. (2007). *Functional Skills and Standards.* (see pg. 12, Speaking and Listening Level 2, bullets 1 and 4)

Illustrative International Benchmarks

- A counterpart of this standard appears in the English language arts standards and learning outcomes from the following high performing countries, as defined by their top 10 ranking on the 2006 Programme of International Student Assessment (PISA) Reading Scale:

1. **Hong Kong:** *English Language Curriculum and Assessment Guide*, 2007. (≈Grades 10-11) (see Speaking, "Participate Effectively...", bullets 3-4 and 6)

- A counterpart of this standard also appears in the English language arts standards of the following :

1. **England:** *English Programme of Study for Key stage 4*, 2005 (≈ Grades 10-11) (see 2.1.d-e)

Illustrative Alignment with State and Other Standards

Evidence for Individual Reading, Writing, and Speaking and Listening Standards

- Intersegmental Committee of the Academic Senates (ICAS). (2002) *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities.* (see Fostering Habits of Mind Essential for Success, bullet 7; Listening and Speaking, Speaking, bullets 1-4)
- A counterpart of this standard appears in the English language arts standards from the following states:

    1. **Massachusetts**: *English Language Arts Curriculum Framework*, June 2001. (see General Standard 1: Discussion; General Standard 2: Questioning, Listening, and Contributing)
    2. **Texas:** *Texas College Readiness Standards*, (2008). (see pg. 4-5, Listening, B.1)

Evidence for Individual Math Standards

What follows is a sample of sources consulted in the drafting of the core math standards. Citations are organized by the standard to which they pertain. For example, all sources with specific relevance to standard #2 (Number) are listed below that standard. Each citation contains a link to the section of the source document that is relevant to the core math standard to which it corresponds. For more information on sources and how they were used in the drafting of the math standards, please refer to the "College and Career Readiness Standards for Mathematics."

1. Mathematical Practice

2. Number

National Reports

- *NAEP Math Framework 2009* – Number Properties and Operations Strand (p. 7-8 description, standards follow)
- AMATYC, *Crossroads* - Standard C-1 Number Sense
- NCTM, *Focal Points* - Number and Operations Focal Points
- NCTM *Principles and Standards* - Number and Operations Standard

College Readiness

- ACT *College Readiness Standards* - Basic Operations and Applications; Numbers: Concepts & Properties
- *Advanced Placement Computer Science*, Statistics and Computer Science Course Descriptions - Computer Science Prerequisite (p.7)
- Conley, D.T. (2008). *Knowledge and Skills for University Success* - Computation Strand (p.31-32), Mathematical Reasoning (p. 35-37)
- *College Board Standards for College Success*: Mathematics and Statistics. College Board, (2006) - Middle School Math Standards p.iii
- *Ready or Not: Creating a High School Diploma That Counts*. American Diploma Project, (2004) - Number sense and Numerical Operations Strand

Illustrative International Benchmarks

- **Alberta** - General Outcomes - Number Strand p. 3
- **Belgium** - 2 Number theory and algebra strand
- **China** - Numbers and Algebra strand
- **Chinese Taipei** - 1. Numbers and Coordinate system, pgs. 31-32
- **England** - Number and Algebra
- **Hong Kong** - Number and Algebra Dimension
- **India** - Number Systems Unit, Grade 9
- **Ireland** – Leaving Certificate - Arithmetic
- **Japan** - Math I course
- **Korea** - Strand A Numbers and Operations
- **Singapore** - Topic 1 Numbers and Algebra
- Program for International Student Assessment (PISA), (2006) - Quantity Overarching Idea (p. 89-92)
- Trends in International Mathematics and Science Study (TIMSS), (2007) - Number

Evidence for Individual Math Standards

- International Baccalaureate, Mathematics Standard Level, (2006) - Prior Knowledge (Number and Algebra)
- EdExcel, General Certificate of Secondary Education, Mathematics, (2009) - Number and Algebra

Illustrative Alignment with State and Other Standards

- **California** - State Standards - Algebra I
- **Florida** - State Standards – Algebra
- **Georgia** - State Standards - Number and Operations (throughout)
- **Massachusetts** - State Standards - Number Sense and Operations
- **Minnesota** - State Standards - Algebra Strand

3. Quantity

National Reports

- *NAEP Math Framework 2009* – Measurement Strand (p. 13-14 description, standards follow. Strand called "Geometry and Measurement" in grade 12)
- AMATYC, *Crossroads* - Standard C-3: Geometry
- NCTM, *Focal Points* - Number and Operations and Measurement Focal Points
- NCTM *Principles and Standards* - Measurement Standard

College Readiness

- ACT *College Readiness Standards* - Numbers: Concepts & Properties; Measurement
- Conley, D.T. (2008). *Knowledge and Skills for University Success* - General Foundation Skills (Natural Science Standards) (p.44)
- *Ready or Not: Creating a High School Diploma That Counts*. American Diploma Project, (2004) - Number sense and Numerical Operations

Illustrative International Benchmarks

- **Alberta** - General Outcomes - Number Strand
- **China** - Numbers and Algebra ; Space and Figures Strands
- **England** - Geometry and Measures Strand
- **Hong Kong** - Measures, Shape and Space Dimension
- **Singapore** - Topic 1 Numbers and Algebra; Topic 2 Geometry and Measurement
- Program for International Student Assessment (PISA), (2006) - Quantity Overarching Idea
- Trends in International Mathematics and Science Study (TIMSS), (2007) - Number
- International Baccalaureate, Mathematics Standard Level, (2006) - Prior Knowledge (Number and Algebra), pgs. 2-3
- EdExcel, General Certificate of Secondary Education, Mathematics, (2009) - Shape, space and measures

Illustrative Alignment with State and Other Standards

- **California** - State Standards - Throughout Measurement and Geometry strand in K-7 (e.g. p. 32)
- **Florida** - State Standards – Algebra; Financial Literacy
- **Massachusetts** - State Standards - Measurement

- **Minnesota** - State Standards - Geometry and Measurement Strand

4. Expressions

National Reports

- *NAEP Math Framework 2009* – Number Properties and Operations Strand (p. 7-8 description, standards follow); Algebra Strand (p. 30-31 description, standards follow)
- AMATYC, *Crossroads* - Standard C-2: Symbolism and Algebra
- NCTM, *Focal Points* - Number and Operations and Algebra Focal Points
- NCTM *Principles and Standards* - Number and Operations Standard; Algebra Standard

College Readiness

- ACT *College Readiness Standards* - Expressions, Equations & Inequalities
- *Advanced Placement Calculus*, Statistics and Computer Science Course Descriptions - Calculus Prerequisite (p.6); Statistics Prerequisite (p.6); Computer Science Prerequisite (p.7)
- Conley, D.T. (2008). *Knowledge and Skills for University Success* - Computation Strand (p.31-32); Algebra Strand (p32-34)
- *College Board Standards for College Success*: Mathematics and Statistics. College Board, (2006) - Algebra I Standards (p.v); Algebra II Standards (p.vii)
- *Ready or Not: Creating a High School Diploma That Counts*. American Diploma Project, (2004) - Algebra Strand

Illustrative International Benchmarks

- **Alberta** - General Outcomes - Patterns and Relations Strand
- **Belgium** - 2 Number theory and algebra Strand
- **China** - Numbers and Algebra strand
- **Chinese Taipei** - 3. Polynomials, pgs. 32-33
- **England** - Number and Algebra
- **Finland** - MAB1 Expressions and equations
- **Hong Kong** - Number and Algebra Dimension
- **India** - Algebra Unit, Grade 10
- **Ireland** – Leaving Certificate - Algebra
- **Japan** - Math I course p. 59
- **Korea** - Strand B Variables and Expressions
- **Singapore** - Topic 1 Numbers and Algebra
- Trends in International Mathematics and Science Study (TIMSS), (2007) - Algebra
- International Baccalaureate, Mathematics Standard Level, (2006) - Prior Knowledge (Number and Algebra)
- EdExcel, General Certificate of Secondary Education, Mathematics, (2009) - Number and Algebra

Illustrative Alignment with State and Other Standards

- **California** - State Standards - Algebra I; Algebra II
- **Florida** - State Standards – Algebra
- **Georgia** - State Standards –Mathematics 3, Algebra
- **Massachusetts** - State Standards - Patterns, Relations and Algebra
- **Minnesota** - State Standards - Algebra Strand

Evidence for Individual Math Standards

5. Equations

National Reports

- *NAEP Math Framework 2009* – Number Properties and Operations Strand (p. 7-8 description, standards follow); Algebra Strand (p. 30-31 description, standards follow)
- AMATYC, *Crossroads* - Standard C-2: Symbolism and Algebra
- NCTM, *Focal Points* - Number and Operations and Algebra Focal Points
- NCTM *Principles and Standards* - Number and Operations Standard; Algebra Standard

College Readiness

- ACT *College Readiness Standards* - Expressions, Equations & Inequalities
- *Advanced Placement Calculus*, Statistics and Computer Science Course Descriptions - Calculus Prerequisite (p.6); Statistics Prerequisite (p.6); Computer Science Prerequisite (p.7)
- Conley, D.T. (2008). *Knowledge and Skills for University Success* - Computation Strand (p.31-32); Algebra Strand (p32-34)
- *College Board Standards for College Success*: Mathematics and Statistics. College Board, (2006) - Algebra I Standards (p.v); Algebra II Standards (p.vii)
- *Ready or Not: Creating a High School Diploma That Counts*. American Diploma Project, (2004) - Algebra Strand

Illustrative International Benchmarks

- **Alberta** - General Outcomes – Patterns and Relations Strand
- **Belgium** - 2 Number theory and algebra Strand
- **China** - Numbers and Algebra strand
- **Chinese Taipei** - 3. Polynomials, pgs. 32-33
- **England** - Number and Algebra
- **Finland** - MAB1 Expressions and equations
- **Hong Kong** - Number and Algebra Dimension
- **India** - Algebra Unit
- **Ireland** – Leaving Certificate - Algebra
- **Japan** – Math I course; Math II course
- **Korea** - Strand B Variables and Expressions
- **Singapore** - Topic 1 Numbers and Algebra
- Program for International Student Assessment (PISA), (2006) - Change and Relationships Overarching Idea (p. 86-89)
- Trends in International Mathematics and Science Study (TIMSS), (2007) - Algebra
- International Baccalaureate, Mathematics Standard Level, (2006) - Functions and Equations, pgs. 4-5; Prior Knowledge (Number and Algebra), pgs. 2-3
- EdExcel, General Certificate of Secondary Education, Mathematics, (2009) - Number and Algebra

Illustrative Alignment with State and Other Standards

- **California** - State Standards - Algebra I; Algebra II
- **Florida** - State Standards – Algebra
- **Georgia** - State Standards – Mathematics 3, Algebra
- **Massachusetts** - State Standards - Patterns, Relations and Algebra
- **Minnesota** - State Standards - Algebra Strand

Evidence for Individual Math Standards

6. Functions

National Reports

- NAEP *Math Framework 2009* – Number Properties and Operations Strand (p. 7-8 description, standards follow); Algebra Strand (p. 30-31 description, standards follow)
- AMATYC, *Crossroads* - Standard C-4: Function
- NCTM, *Focal Points* - Algebra Focal Points
- NCTM *Principles and Standards* - Algebra Standard

College Readiness

- ACT *College Readiness Standards* – Functions
- *Advanced Placement Calculus*, Statistics and Computer Science Course Descriptions - Calculus Prerequisite (p.6); Statistics Prerequisite (p.6); Computer Science Prerequisite (p.7)
- Conley, D.T. (2008). *Knowledge and Skills for University Success* - Algebra Strand (p32-34)
- *College Board Standards for College Success*: Mathematics and Statistics. College Board, (2006) - Algebra II Standards (p.vii)
- *Ready or Not: Creating a High School Diploma That Counts*. American Diploma Project, (2004) - Algebra Strand

Illustrative International Benchmarks

- **Alberta** - General Outcomes - Patterns and Relations Strand
- **Belgium** - 3 Real functions
- **China** - Numbers and Algebra strand
- **Chinese Taipei** - 4. Exponent and logarithm; 5. The basic concept of trigonometric functions, pgs. 33-34
- **England** - Number and Algebra
- **Finland** - MAB3 Mathematical Models 1; MAB4 Mathematical analysis; MAB6 Mathematical Models II
- **Hong Kong** - Number and Algebra Dimension
- **India** - Sets and Function, Grade 11
- **Ireland** – Leaving Certficate, Functions and Calculus
- **Japan** - Math I course; Math II course
- **Korea** - Strand D Functions
- **Singapore** - Topic 1 Numbers and Algebra
- Program for International Student Assessment (PISA), (2006) - Change and Relationships Overarching Idea
- Trends in International Mathematics and Science Study (TIMSS), (2007) - Algebra
- International Baccalaureate, Mathematics Standard Level, (2006) - Functions and Equations, pgs. 4-5
- EdExcel, General Certificate of Secondary Education, Mathematics, (2009) - Number and Algebra

Illustrative Alignment with State and Other Standards

- **California** - State Standards - Algebra II
- **Florida** - State Standards – Algebra
- **Georgia** - State Standards – Mathematics 3, Algebra
- **Massachusetts** - State Standards - Patterns, Relations and Algebra
- **Minnesota** - State Standards - Algebra Strand

Evidence for Individual Math Standards

7. Modeling

National Reports

- NAEP *Math Framework 2009* - Algebra Strand (p. 30-31 description, standards follow)
- AMATYC, *Crossroads* - Standard C-4: Function
- NCTM, *Focal Points* - Algebra Focal Points
- NCTM Principles and Standards - Algebra Standard

College Readiness

- ACT *College Readiness Standards* - Expressions, Equations & Inequalities
- *Advanced Placement Calculus*, Calculus Course Descriptions - Calculus Prerequisite (p.6)
- Conley, D.T. (2008). *Knowledge and Skills for University Success* - Algebra Strand (p32-34)
- *College Board Standards for College Success*: Mathematics and Statistics. College Board, (2006) - Algebra II (p.vii)
- *Ready or Not: Creating a High School Diploma That Counts*. American Diploma Project, (2004) - Algebra Strand

Illustrative International Benchmarks

- **Alberta** - General Outcomes - Patterns and Relations Strand
- **China** - Numbers and Algebra Strand
- **England** - Number and Algebra
- **Finland** - MAB3 Mathematical Models 1; MAB6 Mathematical Models II
- **India** - Mathematical Modeling
- **Singapore** - Topic 1 Numbers and Algebra
- Program for International Student Assessment (PISA), (2006) - Change and Relationships Overarching Idea (p. 86-89)
- Trends in International Mathematics and Science Study (TIMSS), (2007) - Algebra
- EdExcel, General Certificate of Secondary Education, Mathematics, (2009) - Number and Algebra

Illustrative Alignment with State and Other Standards

- **California** - State Standards - Algebra I
- **Florida** - State Standards - Algebra
- **Georgia** - State Standards - Mathematics 3, Algebra
- **Massachusetts** - State Standards - Patterns, Relations and Algebra
- **Minnesota** - State Standards - Algebra Strand

8. Shape

National Reports

- *NAEP Math Framework 2009* – Geometry Strand (p. 17-19 description, standards follow. Strand called "Geometry and Measurement" in grade 12)
- AMATYC, *Crossroads* - Standard C-3: Geometry
- NCTM, *Focal Points* - Geometry and Measurement Focal Points
- NCTM *Principles and Standards* - Geometry Standard

Evidence for Individual Math Standards

College Readiness

- ACT *College Readiness Standards* - Properties of Plane Figures: Measurement
- *Advanced Placement Calculus,* Calculus Course Descriptions - Calculus Prerequisite (p.6)
- Conley, D.T. (2008). *Knowledge and Skills for University Success* - Geometry (p.34-35)
- *College Board Standards for College Success:* Mathematics and Statistics. College Board, (2006) - Geometry Standards (p. vi)
- *Ready or Not: Creating a High School Diploma That Counts.* American Diploma Project, (2004) - Geometry Strand

Illustrative International Benchmarks

- **Alberta** - General Outcomes - Shape and Space Strand
- **Belgium** - 4 Geometry
- **China** - Mathematics 2; Space and Figures Strand
- **Chinese Taipei** – 6. Characters and application of trigonometric (sic), pg. 34; 2. Straight line and plane of space; 4. Conic section, pgs. 35-36
- **England** - Geometry and Measures Strand
- **Finland** - MAB2 Geometry
- **Hong Kong** - Measures, Shape and Space Dimension
- **India** - Geometry Unit
- **Ireland** - Geometry
- **Japan** - Math II Course; Math A Course
- **Korea** - Strand C Geometry
- **Singapore** - Topic 2 Geometry and Measurement (starting on page 7)
- Program for International Student Assessment (PISA), (2006) - Space and Shape Overarching Idea (p.83-86)
- Trends in International Mathematics and Science Study (TIMSS), (2007) - Geometry
- International Baccalaureate, Mathematics Standard Level, (2006) - Prior Knowledge (Geometry), pgs. 3
- EdExcel, General Certificate of Secondary Education, Mathematics, (2009) - Shape, space and measures

Illustrative Alignment with State and Other Standards

- **California** - State Standards – Geometry
- **Florida** - State Standards – Geometry
- **Georgia** - State Standards -Mathematics 2, Geometry
- **Massachusetts** - State Standards - Geometry
- **Minnesota** - State Standards - Geometry and Measurement Strand

9. Coordinates

National Reports

- *NAEP Math Framework 2009* – Geometry Strand (p. 17-19 description, standards follow. Strand called "Geometry and Measurement" in grade 12)
- AMATYC, *Crossroads* - Standard C-3: Geometry
- NCTM, *Focal Points* - Geometry and Measurement Focal Points
- NCTM *Principles and Standards* - Geometry Standard

Evidence for Individual Math Standards

College Readiness

- ACT *College Readiness Standards* - Graphical Representations
- *Advanced Placement Calculus,* Calculus Course Descriptions - Calculus Prerequisite (p.6)
- Conley, D.T. (2008). *Knowledge and Skills for University Success* - Geometry (p.34-35)
- College Board Standards for College Success: Mathematics and Statistics. College Board, (2006) - Algebra I Standards (p.v); Algebra II Standards (p.vii)
- Ready or Not: Creating a High School Diploma That Counts. American Diploma Project, (2004) - Geometry Strand

Illustrative International Benchmarks

- **Alberta** - General Outcomes - Shape and Space Strand
- **Belgium** - 4 Geometry
- **China** - Mathematics 2; Space and Figures Strand
- **Chinese Taipei** – First Year, 1, Numbers and Coordinate system, pgs. 31-32; Second Year, 1, Vector, pg. 35
- **England** - Geometry and Measures Strand ; Number and Algebra
- **Finland** - MAB2 Geometry
- **Hong Kong** - Measures, Shape and Space Dimension
- **India** - Geometry and Mensuration Units
- **Ireland** - Coordinate Geometry
- **Japan** – Math II Course; Math B Course
- **Korea** - Strand C Geometry
- **Singapore** - Topic 2 Geometry and Measurement
- Program for International Student Assessment (PISA), (2006) - Space and Shape Overarching Idea; Change and Relationships Overarching Idea
- Trends in International Mathematics and Science Study (TIMSS), (2007) - Algebra; Geometry
- International Baccalaureate, Mathematics Standard Level, (2006) - Prior Knowledge (Number and Algebra, and Geometry), pgs. 2-3
- EdExcel, General Certificate of Secondary Education, Mathematics, (2009) - Number and Algebra; Geometry

Illustrative Alignment with State and Other Standards

- **California** - State Standards - Algebra I; Geometry
- **Florida** - State Standards – Algebra
- **Georgia** - State Standards - Geometry
- **Massachusetts** - State Standards - Geometry
- **Minnesota** - State Standards - Geometry and Measurement Strand

10. Probability

National Reports

- *NAEP Math Framework 2009* – Data Analysis, Statistics and Probability Strand (p. 24-25 description, standards follow)
- AMATYC, *Crossroads* - Standard C-5: Discrete Mathematics, Standard C-6: Probability and Statistics
- NCTM *Principles and Standards* - Data Analysis & Probability Standard

Evidence for Individual Math Standards

College Readiness

- ACT College Readiness Standards - Probability, Statistics & Data Analysis [link to ACT_CollegeReadinessStandards_p10-17.pdf]
- Conley, D.T. (2008). *Knowledge and Skills for University Success* - Research & Analysis (Social Science Standards), section B (p.64)
- *College Board Standards for College Success*: Mathematics and Statistics. College Board, (2006) - Geometry Standards (p. vi); Algebra II Standards (p. vii)
- *Ready or Not: Creating a High School Diploma That Counts*. American Diploma Project, (2004) - Data Interpretation, Statistics and Probability Strand

Illustrative International Benchmarks

- **Alberta** - General Outcomes - Statistics and Probability Strand
- **Belgium** - 5 Statistics
- **China** - Mathematics 3; Statistics and Probability Strand
- **Chinese Taipei** – Second Year, 5 Permutation and Combination, p. 37
- **England** - Statistics Strand
- **Finland** - MAB5 Statistics and Probability
- **Hong Kong** - Data Handling Dimension
- **India** - Statistics and Probability Unit, Grade 11
- **Ireland** Discrete Mathematics and Counting
- **Japan** - Math A Course; Math C Course
- **Korea** - Strand E Probability and Statistics
- **Singapore** - Topic 3 Statistics and Probability
- Program for International Student Assessment (PISA), (2006) - Uncertainty Overarching Idea
- Trends in International Mathematics and Science Study (TIMSS), (2007) - Data and Chance
- International Baccalaureate, Mathematics Standard Level, (2006) - Statistics and Probability, pgs. 6-8
- EdExcel, General Certificate of Secondary Education, Mathematics, (2009) - Handling Data

Illustrative Alignment with State and Other Standards

- **California** - State Standards - Algebra II; Probability and Statistics
- **Florida** - State Standards – Probability
- **Georgia** - State Standards – Mathematics 3, Data Analysis and Probability
- **Massachusetts** - State Standards - Data Analysis, Statistics, and Probability
- **Minnesota** - State Standards - Data Analysis & Probability

11. Statistics

National Reports

- NAEP *Math Framework 2009* – Data Analysis, Statistics and Probability Strand (p. 24-25 description, standards follow)
- AMATYC, *Crossroads* - Standard C-6: Probability and Statistics
- NCTM, *Focal Points* - Data Analysis Focal Points
- NCTM Principles and Standards - Data Analysis & Probability Standard

Evidence for Individual Math Standards

College Readiness

- ACT *College Readiness Standards* - Probability, Statistics & Data Analysis
- Conley, D.T. (2008). *Knowledge and Skills for University Success* - Statistics (p.37)
- *College Board Standards for College Success*: Mathematics and Statistics. College Board, (2006) - Middle School Math Standards (p.iii); Algebra I Standards (p.v); Precalculus Standards (p.viii)
- *Ready or Not: Creating a High School Diploma That Counts*. American Diploma Project, (2004) - Data Interpretation, Statistics and Probability Strand

Illustrative International Benchmarks

- **Alberta** - General Outcomes - Statistics and Probability Strand
- **Belgium** - 5 Statistics
- **China** - Mathematics 3; Statistics and Probability Strand
- **Chinese Taipei** – Second Year, 6 Probability and Statistic, pg. 37-38
- **England** - Statistics Strand
- **Finland** - MAB5 Statistics and Probability
- **Hong Kong** - Data Handling Dimension
- **India** - Statistics and Probability Unit, Grade 11
- **Ireland** - Discrete Mathematics and Counting (p.27 and 28)
- **Japan** - Math B Course; Math C Course
- **Korea** - Strand E Probability and Statistics
- **Singapore** - Topic 3 Statistics and Probability
- Program for International Student Assessment (PISA), (2006) - Uncertainty Overarching Idea
- Trends in International Mathematics and Science Study (TIMSS), (2007) - Data and Chance
- International Baccalaureate, Mathematics Standard Level, (2006) - Statistics and Probability, pgs. 6-8
- EdExcel, General Certificate of Secondary Education, Mathematics, (2009) - Handling Data

Illustrative Alignment with State and Other Standards

- **California** - State Standards - Probability and Statistics
- **Florida** - State Standards – Statistics
- **Georgia** - State Standards - Mathematics 3, Data Analysis and Probability
- **Massachusetts** - State Standards - Data Analysis, Statistics, and Probability
- **Minnesota** - State Standards - Data Analysis & Probability

B-5 - FLORIDA'S STANDARDS ADOPTION PROCESS AND TIMELINE - DECEMBER 2009

COMMON CORE AND NEXT GENERATION SUNSHINE STATE STANDARDS

	CURRICULUM ALIGNMENT			INSTRUCTIONAL MATERIALS				PROFESSIONAL DEVELOPMENT				ASSESSMENT			TEACHER CERTIFICATION	
Subject Area	**Public Input for Draft Standards**	**State Board of Education approved**	**Adopt course descriptions**	**Vendor Instructional Materials Alignment**	**State Instructional Materials Adoption Process**	**Contract years for Instructional Materials – District Purchase**	**Classroom implementation of aligned Instructional Materials**	**Develop research-based practices for new standards**	**Lead trainers**	**Teacher training**	**Full implementation of new standards**	**Assessment realignment started**	**Field test**	**New generation of tests first given**	**Educator Preparation Programs**	**Florida Teacher Certification Exam**
Science	October 2007	**February 2008**	June 2008	2009-2010	2010-11	2011-17	**2011-12**	2008-10	2008-11	2008-12	**2011-12**	October 2007	April **(EOC: May)** 2011	April **(EOC: May)** 2012	2008-09	Fall 2009
Social Studies	June 2008	**December 2008**	February 2009	2010-2011	2011-12	2012-18	**2012-13**	2009-10	2010-12	2011-13	**2013-13**	October 2009	May 2012	May 2013	2008-09	Fall 2009
Physical Education	June 2008	**December 2008**	February 2009	2010-2011	2011-12	2012-18	**2012-13**	2008-10	2008-10	2009-11	**2012-13**				2009-10	Fall 2011
Health	June 2008	**December 2008**	February 2009	2010-2011	2011-12	2012-18	**2012-13**	2009-12	2009-12	2010-13	**2012-13**				2009-10	Fall 2011
World Languages	January 2010	**March 2010**	June 2010	2011-2012	2012-13	2013-19	**2013-14**	2010-13	2010-13	2011-13	**2013-14**				2009-10	Fall 2011
Visual Arts	June 2010	**October 2010**	February 2011	2012-2013	2013-14	2014-20	**2014-15**	2011-14	2011-14	2012-14	**2014-15**				2009-10	Fall 2011
Performing Arts	June 2010	**October 2010**	February 2011	2012-2013	2013-14	2014-20	**2014-15**	2011-14	2011-14	2012-14	**2014-15**				2014-15	Fall 2016
Common Core Language Arts	**Feb - May 2010**	**July 2010**	**January 2011**	**2007-2008**	**2008-09**	**2009-15**	**2009-10**	**2010-13**	**2010-13**	**2011-13**	2012-13	**Writing 2011 Reading 2013**	**Writing 2012 Reading 2014**	**Writing 2013 Reading 2015**	**2012-13**	**Fall 2013**
Common Core Mathematics	**Feb – May 2010**	**July 2010**	**January 2011**	**2010-11**	**2010-11**	**2010-16**	**2010-11**	**2010-2011**	**2011-12**	**2012-14**	**2013**	**2013**	**May 2014**	**May 2015**	**2012-13**	**Fall 2013**

Due to the lack of research-based World Language Standards nationally, Florida is proposing the adoption of the Common European Framework for World Languages. This work has begun and is scheduled to be completed in March 2010.

B-6:

ASSESSMENT CONSORTIUM

MEMORANDUM OF AGREEMENT

FROM EACH STATE

ASSESSMENT CONSORTIUM MEMORANDUM OF AGREEMENT

This Memorandum of Agreement ("MOA") is entered into by and between the following States: Arkansas, Colorado, Florida, Illinois, Indiana, Louisiana, Massachusetts, Minnesota, North Carolina, Ohio, Pennsylvania, and Virginia (collectively the "Participating States" or "Assessment Consortium").

1. Purpose. The purpose of this MOA is to form a coalition of states with a shared vision for common assessments that are internationally-benchmarkcd; build toward college and career readiness by the time of high school graduation; measure a common core of standards for K-12 pursuant to the National Governors Association Center for Best Practices Memorandum of Understanding ("Common Core Standards") ; utilize technology for efficiency of delivery and scoring; and are cost effective. An outcome of this shared vision will be a proposal for the federal Race to the Top Assessment Competition in 20 I0 to develop and implement common, high-quality assessments aligned with the Common Core Standards.

2. Lead State. The Participating States agree that Florida shall be designated as the Lead State, and Florida accepts the designation. The Lead State shall manage the work process under this MOA and competitively bid , when determined by the Assessment Consortium, for all services and commodities required to achieve the objectives of this MOA. In particular, the Lead State shall:

a. Direct and oversee meetings of the Assessment Consortium and set the agendas.

b. Pursuant to the laws of the Lead State, procure any necessary goods and services needed to carry out the intent of this MOA, using the most reasonable form of competitive solicitation and by quotes if no competitive solicitation is required.

c. Although the Lead State shall manage and administer the primary contracts, each Participating State shall be a party to any multi-state agreement, by direct execution or by addendum. However, each Participating State shall be responsible for enforcing their portion of the work on any multi-state contract. In addition, the Lead State shall not be responsible for any of the contractual obligations of a Participating State.

d. Coordinate, assist, and task the Management Entity as may be reasonably necessary.

e. Serve as liaison with the U.S. Department of Education, and all other third parties on behalf of the Assessment Consortium.

f. The Lead State may resign by notifying the Participating States at least 30 days in advance by written notice. A majority of the Participating States will then appoint a new Lead State.

g. The Participating States may remove the Lead State and appoint a new Lead State by vote of a majority of the Participating States. Upon the resignation or removal of the Lead State, all contracts and other rights and obligations of the Lead State shall be assigned to the new Lead State.

3. Management Entity. Services of a Management Entity will be procured and utilized to assist the Consortium in conducting its work. A majority vote of the Assessment Consortium is required to award a contract to the Management Entity. The Management Entity shall perform the following services:

a. Assist the Lead State in coordinating and running the Assessment Consortium meetings, including acting as a facilitator at the meetings.

b. Perform research and draft reports necessary for developing Requests for Proposals for goods and services.

c. Assist the Lead State in procuring goods and services as agreed upon by Participating States.

d. Provide advice and grant-writing services to the Assessment Consortium to assist them in developing the proposal for the Race to the Top Assessment Competition.

e. Perform any other activities and services that are reasonably requested by the Lead State or any Participating State in order to achieve the purposes of this MOA.

4. Scope of Work and Responsibilities of the Participating States. Each Participating State in the Assessment Consortium shall adopt the Common Core Standards which were developed to be internationally benchmarked and to build toward college and career readiness by the time of high school graduation. The Assessment Consortium shall, if funded by Race to the Top Assessment Competition funds, develop common, high-quality assessments which are aligned with the Common Core Standards, utilize technology for efficiency of delivery and scoring, result in a common definition of proficiency, and are cost effective. In order to achieve these deliverables, the Assessment Consortium and the individual Participating States shall perform the following activities.

a. Each Participating State will adopt the Common Core Standards using their state-approved standards-adoption process.

b. The Assessment Consortium will meet to define the process for procuring the services of a Management Entity by April 30, 20 I0

c. The Assessment Consortium will develop and submit a proposal for funding through the Race to the Top Assessment Competition by June 2010 or the due date established by the U.S. Department of Education .

d. The Assessment Consortium will meet, with the assistance of a Management Entity, to review the status of each Participating State's Common Core Standards adoption by August 2, 2010.

e. The Assessment Consortium will develop a plan by December 10, 20I 0, for sharing of test items and tasks aligned with the Common Core Standards for use in Participating States' LEAs for formative and interim assessment purposes.

5. Meetings and Quorum. Meetings may be called by the Lead State or a majority of the Participating States. Meetings may either be in person or by conference call. Written notice of the meeting shall be sent to all Participating States at least 48 hours in advance, by email, facsimile, or certified mail.

a. A Quorum for any meeting shall consist of designated representatives from at least two-thirds of the Participating States. An individual state may appear by phone and be counted as part of the Quorum. Each Participating State shall have one vote.

b. All actions or decisions of the Assessment Consortium shall, unless otherwise designated elsewhere in this MOA, require a majority vote to pass.

c. Actions and decisions of the Assessment Consortium may also be taken by written directive executed by a majority of the Participating States without a formal meeting.

d. Notwithstanding the above, any amendment to this MOA shall require a unanimous vote of the Participating States.

6. Exam Results. Each Participating State shall own their respective assessment results and any other documentation which are developed as a result of any particular state assessment. All Participating States shall jointly own all deliverables produced as a result of this MOA, and shall have the right to utilize all deliverables and documents produced under this MOA for the benefit of their respective state, subject to all state and federal confidentiality laws and regulations.

7. Termination and Withdrawal of Parties.

a. This MOA may be terminated by agreement of all the Participating States.

b. Any Participating State may withdraw from this MOA upon thirty days written notice to all Participating States. In addition, any Participating State may immediately withdraw from this MOA upon notice of a loss of state funding to support the assessment work. A notice specifying the reasons for immediate termination shall be sent as soon as possible after the termination to the Participating States.

c. A withdrawn Participating State may only participate in a contract or agreement it executed prior to its withdrawal from the Assessment Consortium and this MOA.

d. A Participating State may have their rights hereunder terminated in the event it fails to perform or comply with any of its material covenants or obligations contained in this MOA, and such failure is not remedied and cured in all material respects within fifteen (15) days after the date written notice of such failure is delivered to the Participating State by the Lead State. A termination for default under this provision shall effectively terminate all contracts and agreements entered into by the terminated Participating State which have been procured through this MOA. Upon demand by the Lead State, the terminated Participating State shall provide written proof that such agreements have been terminated, However, the determination of default must be made by a majority of the Participating States before the Lead State is authorized to take any action against a defaulting Participating State.

8. Confidential Information. The Participating States warrant they shall not disclose to any third party any personally identifiable information about any student, without the written consent of the Participating State that owns the data. This applies to information which came from any record or report used by the Assessment Consortium or from any education record which is subject to the Family Educational Rights and Privacy Act, 20 U.S.c. Section 1232g. The term "educational record" shall have the meaning prescribed in 20 U.S.c. Section 1232g(a)(4).

9. Expenses. It is the intent of the Participating States to seek funding from various third parties for the development of the common, high quality assessments and other shared deliverables under this MOA, and for the cost of a Management Entity. However, prior to obtaining such funds, the Participating States agree that they shall equally share these expenses. Decisions on whether to incur a shared expense and the amount to incur shall be decided by a majority vote of the Assessment Consortium. Notwithstanding the above , the Participating States also agree that they shall individually pay for any state specific expenses, including travel and the costs related to any state's use of an assessment.

10. Miscellaneous Provisions.

a. **Rules of Interpretation.** The Participating States waive application of the principle of contract construction that ambiguities are to be construed against a contract's drafter, and agree that this MOA is a joint product of all Participating States.

b. **Assignment.** No Participating State may assign any of its rights or obligations hereunder without the prior written consent of the Assessment Consortium.

c. **Additional Documentation.** Each Participating State agrees to take such action and to execute and deliver all documents necessary to carry out the terms and conditions of this MOA.

d. **Invalidity and Severability.** In the event that any provision of this Contract shall be held to be invalid, such provision shall be null and void. The validity of the remaining provisions of the MOA shall not in any way be affected thereby.

e. **Counterparts.** This Contract maybe executed in multiple counterparts, each of which shall be deemed to be an original and all of which shall constitute one contract, notwithstanding that all parties are not signatories to the original or the same counterpart, or that signature pages from different counterparts are combined, and the signature of any party to any counterpart shall be deemed to be a signature too and may be appended to any other counterpart.

f. **Authority to Execute.** Each Participating State warrants that it has the authority to enter into this MOA, and the party executing hereunder has the full authority to bind that state.

IN WITNESS WHEREOF, the Participating States have, through their duly authorized representative, executed this Memorandum of Agreement, which shall be effective, as of the last signature date below.

STATE OF ARKANSAS
By: _____
Name: _____
Title: _____
Date: _____

STATE OF INDIANA
By: _____
Name: _____
Title: _____
Date: _____

STATE OF COLORADO
By: _____
Name: _____
Title: _____
Date: _____

STATE OF ILLINOIS
By: _____
Name: _____
Title: _____
Date: _____

STATE OF LOUISIANA
By: _____
Name: _____
Title: _____
Date: _____

COMMONWEALTH OF MASSACHUSETTS
By: _____
Name: _____
Title: _____
Date: _____

STATE OF NORTH CAROLINA
By: _____
Name: _____
Title: _____
Date: _____

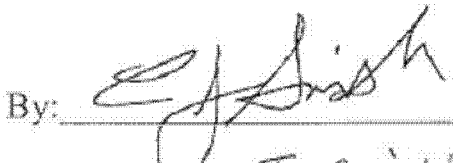
STATE OF MINNESOTA
By: _____
Name: _____
Title: _____
Date: _____

STATE OF OHIO
By: _____
Name: _____
Title: _____
Date: _____

COMMONWEALTH OF PENNSYLVANIA
By: _____
Name: _____
Title: _____
Date: _____

COMMONWEALTH OF VIRGINIA
By: _____
Name: _____
Title: _____
Date: _____

STATE OF FLORIDA

By: 

Name: Eric J. Smith

Title: Commissioner

Date: December 31, 2009

COMMONWEALTH OF MASSACHUSETTS

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MINNESOTA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF PENNSYLVANIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF ARIZONA

By: Tom Horne

Name: Tom Horne
Title: Superintendent of Public Instruction
Date: January 6, 2010

DISTRICT OF COLUMBIA

By: _____

Name: Kerri L. Briggs
Title: State Superintendent
Date: January 11, 2010

COMMONWEALTH OF MASSACHUSETTS

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MINNESOTA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF PENNSYLVANIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

GEORGIA DEPARTMENT OF EDUCATION

By: Kathy Cox

Name: Kathy Cox
Title: State School Superintendent
Date: 1/15/2010

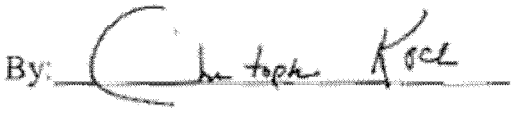
STATE OF MINNESOTA
By: _____
Name: _____
Title: _____
Date: _____

STATE OF OHIO
By: _____
Name: _____
Title: _____
Date: _____

COMMONWEALTH OF PENNSYLVANIA
By: _____
Name: _____
Title: _____
Date: _____

COMMONWEALTH OF VIRGINIA
By: _____
Name: _____
Title: _____
Date: _____

STATE OF ILLINOIS

By: 

Name: Christopher A. Koch, Ed.D.
Title: State Superintendent of Education
Date: January 11, 2010

STATE OF NORTH CAROLINA

By: _____
Name: _____
Title: _____
Date: _____

STATE OF MINNESOTA

By: _____
Name: _____
Title: _____
Date: _____

STATE OF OHIO

By: _____
Name: _____
Title: _____
Date: _____

COMMONWEALTH OF PENNSYLVANIA

By: _____
Name: _____
Title: _____
Date: _____

COMMONWEALTH OF VIRGINIA

By: _____
Name: _____
Title: _____
Date: _____

STATE OF INDIANA

By:

Name: Dr. Tony Bennett
Title: Supt. of Public Instruction
Date: January 5, 2010

COMMONWEALTH OF MASSACHUSETTS

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MINNESOTA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF PENNSYLVANIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF KENTUCKY

By: [signature]

Name: Terry Holliday
Title: Commissioner
Date: 1/13/10

STATE OF NORTH CAROLINA

By: _____
Name: _____
Title: _____
Date: _____

COMMONWEALTH OF PENNSYLVANIA

By: _____
Name: _____
Title: _____
Date: _____

STATE OF MINNESOTA

By: _____
Name: _____
Title: _____
Date: _____

STATE OF OHIO

By: _____
Name: _____
Title: _____
Date: _____

COMMONWEALTH OF VIRGINIA

By: _____
Name: _____
Title: _____
Date: _____

STATE OF LOUISIANA

By: _____
Name: PAUL PASTOREK
Title: SUPERINTENDENT
Date: 1/4/10

COMMONWEALTH OF MASSACHUSETTS

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MINNESOTA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF PENNSYLVANIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MARYLAND

By: Nancy S. Grasmick

Name: Nancy S. Grasmick
Title: State Superintendent of Schools
Date: January 14, 2010

COMMONWEALTH OF MASSACHUSETTS

By: Mitchell D. Chester

Name: Mitchell D. Chester
Title: Commissioner
Date: 1-15-2010

STATE OF MINNESOTA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF PENNSYLVANIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF MASSACHUSETTS

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MINNESOTA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF PENNSYLVANIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MISSISSIPPI

By: Tom Burnham

Name: Tom Burnham
Title: State Superintendent
Date: January 13, 2010

COMMONWEALTH OF MASSACHUSETTS

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MINNESOTA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF PENNSYLVANIA

By:_____

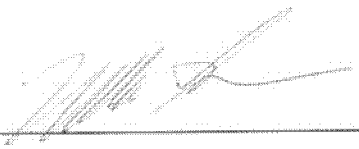
Name:_____
Title:_____
Date:_____

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NEW JERSEY

By: 

Name: Willa Spicer
Title: Deputy Commissioner
Date: January 8, 2010

COMMONWEALTH OF MASSACHUSETTS

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MINNESOTA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NEW YORK

By:_____

Name: David M. Steiner
Title: Commissioner of Education
Date: January 14, 2010

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF PENNSYLVANIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF MASSACHUSETTS

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MINNESOTA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By: June St. Clair Atkinson

Name:June St.Clair Atkinson
Title:State Superintendent
Date: January 5, 2010

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date: _____

COMMONWEALTH OF PENNSYLVANIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date: _____

COMMONWEALTH OF PENNSYLVANIA

By: Gerald L. Zahorchak

Name: Gerald L. Zahorchak, D.Ed.__
Title: Secretary of Education _____
Date: 1/8/10_____

COMMONWEALTH OF VIRGINIA

By:

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date: _____

COMMONWEALTH OF PENNSYLVANIA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF SOUTH CAROLINA

By:_____

Name: Jim Rex
Title: State Superintendent of Education
Date: January 13, 2010

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF MASSACHUSETTS

By:_____

Name:_____
Title:_____
Date:_____

STATE OF MINNESOTA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF NORTH CAROLINA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF OHIO

By:_____

Name:_____
Title:_____
Date: _____

COMMONWEALTH OF PENNSYLVANIA

By:_____

Name:_____
Title:_____
Date:_____

COMMONWEALTH OF VIRGINIA

By:_____

Name:_____
Title:_____
Date:_____

STATE OF TENNESSEE

By:

Name: Timothy K. Webb, Ed.D.
Title: Commissioner
Date: 01/13/2010

B-7: ASSESSMENT CONSORTIUM FOUNDATIONAL AGREEMENTS

Race to the Top
Common Assessment Consortium

States	Arizona, Colorado, District of Columbia, Florida, Illinois, Indiana, Kentucky, Louisiana, New Jersey, North Carolina, Pennsylvania, South Carolina
Purpose	Consortium states will work collaboratively to build a balanced assessment system that advances the quality, effectiveness, and efficiency of measures of achievement to improve learning and instruction, resulting in a significant increase in percent of career- and college-ready high-school graduates.
Vision	A system of common assessments that: measures the full depth, breadth, and rigor of the Common Core State Standards, is balanced to include formative, interim, and summative assessments, will be operational in three years, by the 12/13 school year, and is scalable across the full range of Consortium states.

The Consortium states will develop ***common summative assessments*** which:

- have a common definition of proficiency for all Consortium states,
- measure and report a clear, grade-by-grade progression towards college and career readiness,
- include valid, fair, and stable measures of annual gains in achievement for each student (e.g., a cross-grades vertical scale),
- have defensible measurement qualities which allow their use in accountability and teacher effectiveness systems,
- are internationally benchmarked,
- are built upon technology systems for efficiency of delivery and scoring,
- are cost efficient, particularly in terms of ongoing administration costs,
- will provide verified student results within two weeks of administration, and
- incorporate significant innovations in test item quality within 3 years.

Consortium Principles:

- Each state will adopt the Common Core Standards using the state-approved system.
- Consortium management, decision making, and procurement are guided by the Memorandum of Agreement.
- Consortium states will initiate collaborative work with the assistance of a management entity and collaborate to acquire funding for these initiatives, including through the Race to the Top Common Assessment Competition.
- Each state has unique governance, procurement, and socioeconomic conditions which require thoughtful, flexible processes to ensure success of the Common Assessment Consortium.
- All goods and services will be acquired through a procurement process that is fair, open, and conforms to each member state's procurement laws.

- Complex systems, such as those proposed by the Consortium, will become operational most efficiently and more likely be successful if foundational work exists and design and piloting are done with a representative and diverse group of states.
- The products and resources developed by the Consortium will achieve economies of scale and, ultimately, provide all Common Core states with access to these high-quality, innovative, research-based resources.

Foundational Agreements for Common Assessment Consortium:

Formative Assessment System

Formative assessment is a critical component of a balanced assessment system. Classroom-based formative assessments complement interim and large-scale summative tests by providing evidence of thinking as students perform tasks, explain their reasoning, and justify their solutions. The evidence collected enables teachers to differentiate instruction based on students' cognitive strategies rather than on correct/incorrect answers. By identifying gaps and correcting misconceptions in understanding, teachers will help students build a solid conceptual foundation which is essential to learn and excel in advanced coursework.

Consortium states will provide districts and schools with a system of formative assessment for the Common Core. As one example, Florida is currently developing a Mathematics Formative Assessment System (MFAS) for K-3 students which reflects the qualities research has identified as most effective. The Common Assessent Consortium will expand such a system to other grades and subjects. Features of the expanded formative assessment system will include:

- Learning progressions defined within the Common Core to provide expected instructional trajectories and an organizational structure for formative assessment resources.
- Classroom assessment tasks designed to gather evidence of student thinking and skill on Common Core Standards and indicators.
- Task-specific rubrics to assist teachers in evaluating and interpreting students' performance on the tasks.
- Exemplars and annotated samples of student work as anchors for rating students' performance to improve teachers' consistency and accuracy.
- Rubrics and exemplars will be designed so as to allow students to evaluate their own work and identify areas of misunderstanding or which need further development.
- Examples of research-based feedback strategies teachers should use so that students will have confidence and persistence to advance their learning.
- Possible instructional responses based upon students' performance in order to differentiate and target instruction.
- Lesson study toolkits for teachers focused on practices of looking at student work, providing effective feedback to students, and differentiating instruction.

The Formative Assessment System will be accessible through The Common Core Teacher Standards Instructional Tool. The Consortium states will contribute and have access to Common Core formative assessment tasks/rubrics and exemplars through the Standards Tool. When the Tool is fully functional and populated with high-quality resources, the Consortium will provide access to all states that have adopted the Common Core. The design features will allow this system to continue to expand and improve through contributions of resources, quality review of contributed resources, and a user-rating system that will suppress resources that have proven ineffective through practice.

The Common Core Teacher Standards Instructional Tool will provide:

- A standards database with Common Core standards.

- Common Core Standards indicator-level information, including cognitive complexity rating, access points for student with disabilities, English Language Proficiency standards, and performance descriptions with exemplars.
- Access to indicator-level resources, including formative assessment tasks/scoring rubrics and exemplars of student work, through a graphical learning progressions menu of Common Core Standards.
- Web links to quality-reviewed model lessons.
- A user-submission and quality-review process for formative assessment tasks, model lessons, and lesson study resources.
- A rating system which filters out consistently low-rated resources and highlights those which users have rated as effective.

For information on a current model see: *www.floridastandards.org*

2010-11 K-3 Mathematics Formative Assessment System will be piloted in selected states. Procurement and development for the Formative Assessment System is initiated.

2011-12 Development and piloting of the Formative Assessment System for grades 4 - 8, Algebra 1, Geometry, and grades K-8 Reading are completed.

2012-13 The Formative Assessment System for Mathematics and Reading will be available to all Consortium states.

2013-14 The Formative Assessment System for Mathematics and Reading will be available to all states.

Key priority for research and innovation: The consortia will provide innovation grants to member states and their partners to develop model syllabi for use in high school courses designed around the Common Core and supported with the formative assessment resources. The model syllabi will align course content to the Common Core College- and Career-Ready Standards and support classroom teachers work to effectively prepare high school graduates.

Interim Assessment System *including computer-adaptive features*

Interim assessments contribute to a balanced assessment system by providing results aligned with the Common Core that can be aggregated and used for a variety of purposes. The interim assessment system will provide results useful to instruction and to inform parents and policymakers of students' progress during the school year. The system will make optimal use of technology so that assessments can be delivered when needed, be adaptive, and provide valid and reliable results quickly.

- Consortium states will define the characteristics of a technology platform that would include item banking for interim assessment items, a test-builder system that guides users toward a resulting test that is valid and reliable, a computer-adaptive test delivery system, and a scoring/reporting system.
- Selection and development of interim assessment items will be guided by detailed specifications to ensure full alignment with the content, skills, and cognitive rigor of the Common Core Standards.
- All test items will be developed using universal design principles allowing valid use for the broadest possible group of students.
- Accommodated versions of items will be developed as needed for English language learners and students with disabilities.
- A component of the interim assessment system will be computer-adaptive, on-demand Common Core tests to be given periodically during the school year.
- Common Summative Assessment performance information will be available to school districts to aggregate with interim assessment results on each Common Core indicator for each student.

This aggregated summative plus interim by-student, by-indicator performance data will provide highly reliable information for improved diagnosis of student learning.

2010-11 Release RFP, procure vendor services, produce test item specifications, begin item development, and begin system platform development
2011-12 Continue development of test items and conduct review for alignment to Common Core
2012-13 Test items are available for consortium states; system platform undergoes user-acceptance and pilot testing
2013-14 The interim assessment system is available for use of Consortium states

Key priority for research and innovation: The Consortium will provide funding to draw on the data gained from interim assessments on Common Core indicators to refine learning progressions based on observed patterns of student progress. Interim assessments on specific indicators, combined when possible with summative results, will also support research into which indicators are most predictive of later success.

Common Summative Assessment System

The Consortium's common summative assessments will be high-quality, scalable within a short time period, designed for multiple purposes including accountability, and include infusion of technically-sound innovations in measurement.

- Consortium members will collaborate on timelines, subject areas and grade- or course-level assessments to develop with participant states.
- At a minimum, common assessments will be those annual assessments required by ESEA for the Common Core.
- A technical advisory committee will be formed to guide the design of the assessment system, the measurement model, and provide ongoing review of the technical characteristics of the assessments.
- Common assessments will be designed in such a way as to allow for reporting of annual student growth in learning.
- Consortium member states will collaborate on development of test designs and performance-level descriptions
- The Consortium will recruit test items from NAEP, TIMSS, and PISA for the item bank.
- Consortium states will collaborate, with the assistance of a contracted vendor, to build common summative assessments using selected-response and machine-scorable constructed-response test items, including innovative items types.
- The Consortium's common summative assessment of mathematics and reading will incorporate machine-scorable test items that are designed to efficiently and validly measure higher-level cognitive skills, process skills, and complex problem-solving as specified in the Common Core Standards.
- The Consortium states will leverage the scale of the common effort to support the development of higher quality items than typical in current large scale assessment; the sharing of these items across states will allow far more to be invested in each item than is currently possible.
- The Consortium states acknowledge that large-scale writing assessments have unique challenges, including instability in cross-years equating, low correlations between skill- and performance-level measures, and costs of administration and scoring. The Consortium states will invest in developing a writing assessment system in alignment with the Common Core that links a large-scale on-demand writing test with classroom-level writing samples collected through standardized methods.

- States may supplement common assessments with additional items measuring additional content (i.e., the 15% of state-specific standards) which will contribute to a state-specific score.
- A Consortium state, or school districts within a state, may elect to deliver parallel equated forms of tests in a paper-based format.
- A standard setting panel, including representatives from each participating state, will convene to set a proficient cut score for each test.
- Results from the common portion of the assessment will be reported within two weeks of assessment administration for use in student-level decisions, for each state's educator evaluation system, and for other state- or national-level accountability purposes.

2010-11 Form technical advisory committee; develop specifications for summative assessments; submit common assessment grant; seek additional partners; procurement of vendor services; begin item development

2011-12 Item review and piloting; begin field testing for some grades and subjects

2012-13 Rollout operational tests for some grades and subjects; set common proficiency standards

2013-14 Rollout operational tests for additional grades and subjects; set common proficiency standards

2014-15 All grades and subject operational; complete proficiency standard setting

Key priority for research and innovation: The consortia will fund a three-year effort to determine whether and how computer adaptive technologies can be scaled to support the full range of summative testing requirements. Computer based adaptive testing offers promise to increase efficiency and to remove floor and ceiling effects in measuring students. The consortia will determine if there is a model for computer adaptive testing that meets the Consortium's vision and principles: measures the full depth, breadth and rigor of the Common Core; ensures maximum stability and minimum error in cross-year equating; allows a cross-grades' developmental scale; and is cost efficient.

A Common Academic Profile

The Consortium will work with partners and seek resources to design and develop an electronic transcript linked to each student that unites their assessment results over their years of schooling and provides a vivid picture of their progress towards college and career readiness. The profile will include summative and interim results, including samples of student writing. Reports will be designed to give educators clear portraits of student growth that link to specific examples of the student's work and performance. This academic "passport" will be invaluable to students who migrate across states, including poor students and the students of military families, and be designed to focus educators, parents, and students on the road to college and career readiness.

B-8: ACHIEVE, INC. AGREEMENT

BOARD OF DIRECTORS

CO-CHAIRS

Governor Phil Bredesen
State of Tennessee

Craig R. Barrett
Former CEO/Chairman of the Board
Intel Corporation

BOARD MEMBERS

Governor Jennifer Granholm
State of Michigan

Edward B. Rust, Jr.
Chairman & Chief Executive Officer
State Farm Insurance

Governor Donald L. Carcieri
State of Rhode Island

Mark B. Grier
Vice Chairman
Prudential Financial, Inc.

Jeff Wadsworth
President & Chief Executive Officer
Battelle

Governor Dave Heineman
State of Nebraska

Governor Deval Patrick
State of Massachusetts

CHAIR EMERITUS

Louis Gerstner, Jr.
Former Chairman & CEO
IBM Corporation

PRESIDENT

Michael Cohen

TREASURER

Peter Sayre
Controller
Prudential Financial, Inc.

January 15, 2010

Dr. Eric J. Smith
Commissioner of Education
Florida Department of Education
Turlington Building, Suite 1514
325 West Gaines Street
Tallahassee, Florida 32399

Dear Commissioner Smith:

Achieve is pleased to confirm Florida's participation in an assessment partnership committed to pursuing the development and implementation of summative assessments that are aligned to the common core standards, that can be used within states as part of statewide assessment systems, and that will enable comparability of results across a maximum number of states.

We have received your formal request to join the other states in this partnership and acknowledge your acceptance of the attached Statement of Principles which will guide our collective work.

Florida's participation in this partnership is critical to its success. We look forward to continuing our important work together in the coming months.

Sincerely,

Michael Cohen
President

States Committed to Assessment Partnership
(As of 10:00 EST on January 15, 2010)

1. Alabama
2. Arizona
3. Arkansas
4. California
5. Delaware
6. District of Columbia
7. Florida
8. Georgia
9. Hawaii
10. Illinois
11. Indiana
12. Kentucky
13. Louisiana
14. Maryland
15. Massachusetts
16. Michigan
17. Minnesota
18. New Hampshire
19. New Mexico
20. North Carolina
21. Ohio
22. Oklahoma
23. Pennsylvania
24. Rhode Island
25. Tennessee
26. Utah
27. Wisconsin

Comparing Student Performance on Common College- and Career-Ready Standards
Statement of Principles

Our state is committed to an education system that prepares all of our students for success in college, careers, and life in the 21st century. We believe in setting *high* expectations for our students and schools that are firmly grounded in what it takes to be successful. We believe in setting *common* expectations across states, and are committed to working with like-minded states to adopt common standards and assessment systems anchored in college and career readiness.

Our state supports common assessments that meet the following principles:

- Aligned to the common core standards
- Anchored in college and career readiness
- Allow for comparison of student results across a maximum number of states
- Enable to the maximum extent possible benchmarking performance against NAEP and international standards
- Cover grades 3 through 8 and high school, including college/career ready measures at the end of high school
- Address three overarching goals: measuring student proficiency, ensuring accountability, and improving teaching and learning
- Enable measurement of student achievement and growth
- Are summative in nature but designed in a manner consistent with more comprehensive assessment systems that also include interim and formative assessments
- Provide valid and reliable measures of student knowledge, understanding of, and ability to apply crucial concepts through the use of a variety of item types and formats
- Leverage technology and economies of scale in order to minimize costs and create assessments that accurately measure student performance
- Provide for timely release of results to better inform practice and support decision-making
- Include the assessment of students identified with disabilities and English language learners and to the extent feasible, use universal design principles

We understand that Achieve will work with other national partners to build on the work of the common core standards and convene states to pursue a common assessment strategy that meets these principles. We are prepared to work with Achieve and its partners in as large a consortium of states as possible to explore the development and implementation of summative assessments that are aligned to the common core standards, that can be used within states as part of statewide assessment systems, and that will enable comparability of results across states. We understand that in pursuing this effort, Achieve and its partners will work closely with other consortia that have been formed to explore areas of common ground and determine whether and how efforts could be combined to achieve comparability of results.

B-9 - Section (B) Initiative Summary Chart

Federal Requirement	Initiative	Outcomes	Total Budget
(B)(3)(i) Supporting the transition to enhanced standards and high-quality assessments	Curricular Tools	• By school year 2012-2013, student and teacher support tools to implement the Common Core will be accessible to all students and teachers in Florida.	$29,619,000
(B)(3)(i) Supporting the transition to enhanced standards and high-quality assessments	Supporting the Transition to High Quality Assessments	• By school year 2013-2014, interim and formative assessment tools will be available to support instruction of and measure student and teacher progress in all core content areas in all Florida schools. Florida will participate in international assessments during the first two years of this grant period to make international comparisons, analyze progress, and determine prioritized areas of need in interim and formative assessment development.	$55,350,000
(B)(3)(i) Supporting the transition to enhanced standards and high-quality assessments	Increased Access to STEM Courses	• Beginning in school year 2010-2011, the percentage of students in Florida enrolled in STEM accelerated coursework, career and technical programs, and middle grades courses with integration of technology will increase annually by 3%.	$4,500,000
(B)(3)(i) Supporting the transition to enhanced standards and high-quality assessments	Classroom Support	• By school year 2013-2014, all participating LEAs will have fully implemented lesson study supported by available resources and remaining LEAs will have access to resources.	10,700,000
TOTAL			$100,169,000

C – 1: AMERICA COMPETES EVIDENCE

Florida has a Statewide Longitudinal Data System,

Including the 12 Elements as Required by the America COMPETES Act

DETAILED EVIDENCE

Element	Current Status	Evidence
With respect to preschool through grade 12 education and postsecondary education:		
1. A unique statewide student identifier that does not permit a student to be individually identified by users of the system (except as allowed by Federal and State law).	The Education Data Warehouse (EDW) assigns each student a unique student identifier that does not permit a student to be individually identified by users of the system (except as allowed by Federal and State law).	Florida has a data element named the K20_EDW_ID that is a unique, anonymous, internally assigned, identifier to the student records in the PK-20 Education Data Warehouse.
2. Student-level enrollment, demographic and program participation information.	The EDW contains student-level enrollment, demographic and program participation information at the PK-12, community college, and university levels since 1995.	Florida has the following data elements related to enrollment, demographic, and program participation information: ***Student Demographics*:** COUNTRY CODE, COUNTRY OF BIRTH CODE, DISABILITY INDICATOR, GENDER, LANGUAGE CODE, LANGUAGE PARENTS SPEAKING, QUALIFYING ARRIVAL DATE, RACE/ETHNICITY, STUDENT BIRTH MONTH AND YEAR ***K12 Enrollment*:** EARLY ADMISSION INDICATOR, ENROLLMENT YEAR, GRADE LEVEL, GRADE PROMOTION STATUS, HOMELESS INDICATOR,

Element	Current Status	Evidence
		INSTITUTION ID, KINDERGARTEN READINESS INDICATOR, LIMITED ENGLISH PROFICIENCY SURVEY DATE, LUNCH STATUS, POSTSECONDARY EDUCATION PLAN, PREKINDERGARTEN PROGRAM PARTICIPANT, PRIOR KINDERGARTEN PROGRAM PARTICIPANT, SECTION 504 ELIGIBLE INDICATOR, SINGLE PARENT, WITHDRAWAL DATE , WITHDRAWAL REASON ***Community College Enrollment:*** COURSE ENROLLMENT INDICATOR, ENROLLMENT TERM, ENROLLMENT YEAR, FEE CLASSIFICATION RESIDENCY, FIRST TIME POSTSECONDARY STUDENT INDICATOR, HIGH SCHOOL ENROLLMENT CODE, INSTITUTION_ID, FULL-TIME /PART-TIME STATUS BY TERM ***University Enrollment:*** CLASSIFICATION LEVEL, COLLEGE LEVEL ACADEMIC SKILLS TEST INDICATOR, COURSE LOAD, DOCTORAL CANDIDACY INDICATOR, ENROLLMENT TERM, ENROLLMENT YEAR, FEE CLASSIFICATION RESIDENCY, FIRST TIME POSTSECONDARY STUDENT INDICATOR, HIGH SCHOOL, INSTITUTION ID TRANSFERS HOUR CUMULATIVE, UNIVERSITY TERM CREDIT HOUR EARNED
3. Student-level information about the points at which students	The EDW tracks students within and across districts in Florida including the points at which students exit,	Each school district and the Department shall develop and implement an automated information system component which shall be part of, and compatible with, the statewide comprehensive management information system. Each information system component shall contain automated

Element	Current Status	Evidence
exit, transfer in, transfer out, drop out, or complete P-16 education programs.	transfer in, transfer out, drop out, or complete PK-20 education programs. Exit codes are assigned to all PK-12 students. The EDW tracks graduation/program completion for postsecondary programs.	student, staff and finance information systems and shall include procedures for the security, privacy and retention of automated records. The procedures for the security, privacy and retention of automated student records shall be in accordance with the requirements of 20 U.S.C. 1232g(b)(3), 34 C.F.R. Part 99 and Section 1002.22, F.S. *State Board of Education Rule 6A-1.0014, Florida Administrative Code* The EDW has withdrawal codes for PK-12 and Adult General Education. The withdrawal code is used to describe the reason the student withdrew from the PK-12 institution. This includes students exiting and completing. The EDW also has data elements for Dropout Prevention data and Postsecondary completion information.
4. The capacity to communicate with higher education data systems.	The EDW communicates with higher education data systems by linking PK-12 data to higher education data.	All data collected from state universities shall, as determined by the commissioner, be integrated into the PK-20 data warehouse. The commissioner shall have unlimited access to such data solely for the purposes of conducting studies, reporting annual and longitudinal student outcomes, and improving college readiness and articulation. All public educational institutions shall provide data to the PK-20 data warehouse in a format specified by the commissioner. *1008.31(3), Florida Statutes*
5. A State data audit system assessing data	The FDOE PK-12, community college, and workforce data systems	The Florida PK-12 data system, community college data system, and workforce education data system all validate the data collected from the LEAs.

Element	Current Status	Evidence
quality, validity and reliability.	validate the data collected from the Local Education Agencies (LEAs) prior to storage in the EDW. The State Auditor General's office reviews the data to assess quality, validity and reliability.	The Auditor General shall periodically examine the records of school districts and other agencies as appropriate, to determine compliance with law and State Board of Education rules relating to the classification, assignment, and verification of full-time equivalent student enrollment and student transportation reported under the Florida Education Finance Program. *s.1010.305(1), Florida Statutes*
With respect to preschool through grade 12 education:		
6. Yearly test records of individual students with respect to assessments under section 1111(b) of the Elementary and Secondary Education Act of 1965.	The EDW contains test records of individual students with respect to assessments under section 1111(b) of the Elementary and Secondary Education Act of 1965 after each test administration.	(7) REQUIRED ANALYSES.--The commissioner shall provide, at a minimum, for the following analyses of data produced by the student achievement testing program: (a) The statistical system for the annual assessments shall use measures of student learning, such as the FCAT, to determine teacher, school, and school district statistical distributions, which shall be determined using available data from the FCAT, and other data collection as deemed appropriate by the Department of Education, to measure the differences in student prior year achievement compared to the current year achievement for the purposes of accountability and recognition. (b) The statistical system shall provide the best estimates of teacher, school, and school district effects on student progress. The approach used by the department shall be approved by the commissioner before implementation. (c) The annual testing program shall be administered to provide for valid statewide comparisons of learning gains to be made for purposes of

Element	Current Status	Evidence
		accountability and recognition. District school boards shall not establish school calendars that jeopardize or limit the valid testing and comparison of student learning gains. *s.1008.22, Florida Statutes*
7. Information on students not tested, by grade and subject.	The EDW stores information on all PK-12 students related to enrollment and assessments.	Florida collects enrollment data (see Element 2) and assessment data (see Element 6). Information for this element is derived by matching the enrollment data to the assessment data. Those in the enrollment data that are not in the assessment data were not tested.
8. A teacher identifier system with the ability to match teachers to students.	The EDW matches teachers to students and has performed analyses on this topic. FDOE is participating in a Gates Foundation Teacher-Student Data Link Project.	The student course record and the teacher course record include five elements: course, beginning period, ending period, section, and term. The combination of these five elements is used to create a unique course ID for each course taught by a teacher. The course offering ID exists in the student course enrollment and the teaching activity data. Linking the unique course offering ID between student course enrollments and teaching activity allows FDOE to match teachers to students. A primary instructor indicator is collected in the teaching activity data. This is used in the case of multiple teachers with the same course offering ID.

Element	Current Status	Evidence
9. Student-level transcript information, including information on courses completed and grades earned.	The EDW stores student-level high school transcript information including courses completed and grades earned.	The High School Transcript data contains information about courses taken by students in grades 9 through 12 as well as courses below ninth grade that the student took in order to earn credit toward a high school diploma. Dual enrollment courses are also included. Information about the courses taken includes the academic year and term in which the course was taken, the amount of credit attempted and the amount earned, the school in which the student was enrolled for graduation and the school at which the student took the course, the grade earned in the course, and the subject area for which the course is applicable for graduation requirements.
10. Student-level college readiness test scores.	The EDW stores student-level college readiness test scores including the Scholastic Aptitude Test (SAT), American College Test (ACT), and Florida's College Placement Test (CPT).	The following data elements are available on college readiness: COLLEGE ENTRY LEVEL SUBTEST CODE & SCORE COLLEGE ENTRY LEVEL TEST TERM & YEAR TEST ID (e.g., ACT, SAT)
With respect to postsecondary education:		
11. Data that provide	The EDW follows students' successful transition from	*State Board of Education Rule 6A-10.0315, Florida Administrative Code* establishes the College Preparatory Testing, Placement, and Instruction.

Element	Current Status	Evidence
information regarding the extent to which students transition successfully from secondary school to postsecondary education, including whether students enroll in remedial coursework.	PK-12 to postsecondary institutions, including those that enroll in remedial coursework.	This program is used to determine if a student needs remedial coursework in postsecondary education. The following *State Board of Education Rule 6A-10.0315(21), Florida Administrative Code* establishes that the Commissioner receives the data: "The Commissioner shall report to the State Board of Education by November 30 each year the results of the common placement testing." FDOE annually publishes the *Performance on Common Placement Tests*, a report of the students who scored above the requisite placement cut scores and do not need remedial coursework *1007.21(2)(c), Florida Statutes* The State Board of Education, in conjunction with the Board of Governors, shall develop articulation accountability measures which assess the status of system-wide articulation processes authorized under s. 1007.23 and establish an articulation accountability process. *1008.38, Florida Statutes* Florida annually publishes the High School Feedback Report which provides information on high school student postsecondary preparation and entrance into postsecondary education.
12. Data that provide other information	The EDW follows students from PK-12 to postsecondary institutions. This includes	*State Board of Education Rule 6A-10.0315, Florida Administrative Code* establishes the College Preparatory Testing, Placement, and Instruction. This program is used to determine if a student needs remedial coursework in

Element	Current Status	Evidence
determined necessary to address alignment and adequate preparation for success in postsecondary education.	information necessary to address alignment and adequate preparation for postsecondary.	postsecondary education. The following *State Board of Education Rule 6A-10.0315(21), Florida Administrative Code* establishes that the Commissioner receives the data: "The Commissioner shall report to the State Board of Education by November 30 each year the results of the common placement testing." FDOE annually publishes the *Performance on Common Placement Tests*, a report of the students who scored above the requisite placement cut scores and do not need remedial coursework The common placement test authorized in s. 1001.03(10) and 1008.30, F.S. or a similar test may be administered to high school students who have chosen one of the four destinations. The results of the placement test shall be used to target additional instructional needs in reading, writing, and mathematics prior to graduation. *1007.21(2)(c), Florida Statutes* The State Board of Education, in conjunction with the Board of Governors, shall develop articulation accountability measures which assess the status of system-wide articulation processes authorized under s. 1007.23 and establish an articulation accountability process. *1008.38, Florida Statutes* Florida annually publishes the High School Feedback Report which provides information on high school student postsecondary preparation and entrance

Element	Current Status	Evidence
		into postsecondary education. Florida's Statewide Course Numbering System (SCNS): The SCNS was created in the 1960s and serves as a key component of Florida's K-20 seamless system of articulation. The system provides a database of postsecondary courses at public vocational-technical centers, community colleges, universities, and participating nonpublic institutions. The assigned numbers describe course content to improve research, assist program planning, and facilitate the transfer of students. Florida's Course Code Directory (CCD): The CCD is a comprehensive information resource consisting of a narrative section providing general and in-depth information on applicable laws and State Board of Education rules; explanations of requirements and policies pertaining to multiple topics, and details on the K-12 course numbering system. All programs and courses funded through the Florida Education Finance Program (FEFP) and courses or programs for which students may earn credit toward high school graduation are included. The CCD assists counselors, students and parents in schedule planning, provides course specific information including course level and length, and lists appropriate teacher certification levels for courses. It allows schools, districts, and the state to identify courses by specific course number, thereby providing comparable information across various levels of administration

Element	Current Status	Evidence
		and consistency in reporting. Florida participates in the America Diploma Project Network: The America Diploma Project (ADP) addresses school improvement issues. This project uses data to support *"a new vision of accountability and the kind of information states should collect, report, and enable schools and districts to use."* ADP analyzed how Florida's college- and career-ready indicators are used, measuring student progress toward college and career readiness.

C-2: FLORIDA'S SLDS R4 PROJECT ABSTRACT

American Recovery and Reinvestment Act
Statewide Longitudinal Data Systems Grant (SLDS R4)
Project Abstract

Data In…Data Out
(CFDA Number 84.384)

1. **The title of the project:** Data In…Data Out

2. **Project Description:** This grant competition and the America COMPETES Act clearly define the necessary requirements for a statewide longitudinal data system. The four assurances in the American Reinvestment and Recovery Act focus on struggling schools, assessment information for instructional improvement, quality teachers in the classroom, and a statewide longitudinal data system. While the Florida Department of Education (FLDOE) currently meets all of the capabilities and system requirements described, FLDOE is using this grant proposal to deepen its commitment to providing data to stakeholders while maintaining student confidentiality.

   In keeping with this goal, FLDOE proposes (1) to upgrade the four major source data systems that are incorporated into Florida's Education Data Warehouse (EDW); (2) to employ a unique identifier system so that social security numbers are no longer the key field for tracking students between the Local Education Agencies and the State; (3) to provide several different reporting capabilities for use by a myriad of stakeholders; and (4) to implement a data mining tool for FLDOE to analyze and evaluate its programs and policies more efficiently and effectively.

   The proposed project will provide new analytic dimensions and student confidentiality mechanisms currently unavailable in any state. Not only will there be results reported on periodic, current schedules, but on a longitudinal basis as well. The project will result in processes and tools that may be replicated in other states. It will serve as a national model that can be adapted and improved upon by others.

3. **The expected outcome of the project on the State's education data system:** This project is expected to improve the usability of FLDOE's data by focusing on TIMELINESS, ACCURACY and ACCESSIBILITY while maintaining CONFIDENTIALITY and allowing for program EVALUATION.

   The source data systems will make the data more timely by implementing new processing methodologies and implementing more periodic system updates. During the system upgrades, FLDOE will implement a statistical validation process verifying data quality to ensure its accuracy. Accuracy at the source system is important to ensure accuracy within the EDW. The proposed system upgrades will also prepare FLDOE's data system to provide more timely feedback to teachers for instructional improvement purposes.

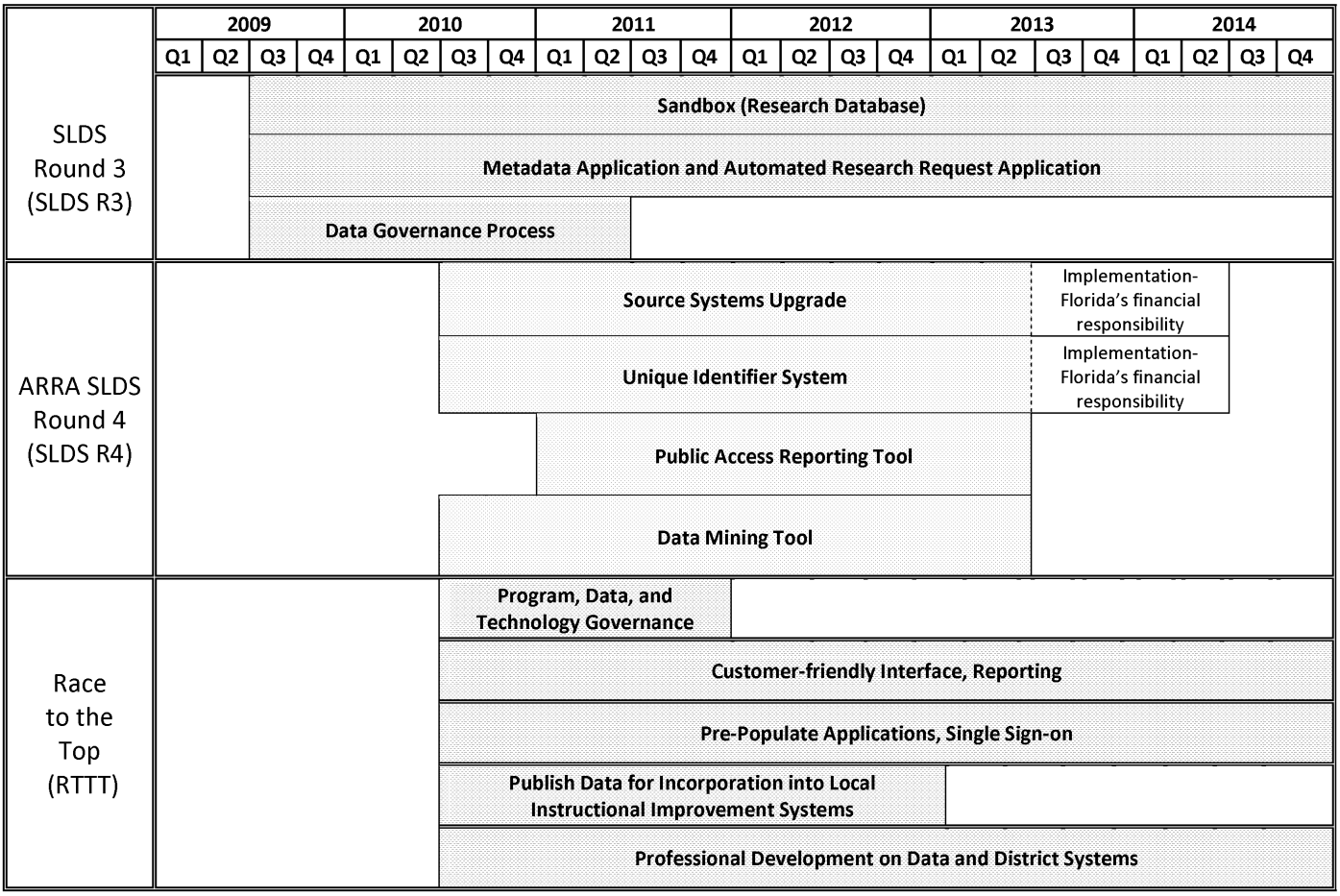
The reporting capabilities will increase the accessibility of FLDOE's data to a multitude of stakeholders. The various reporting capabilities will be designed to meet the needs of stakeholders with a range of perspectives and expertise.

The unique identifier system will promote confidentiality regarding student information as data is transferred between the LEAs and the State. The identifier will be different than the one currently assigned by the EDW so that when disclosing coded, deidentified unit record data a student's identity cannot be determined.

Finally, the data mining tool will work with data from the EDW to provide evaluation and analysis of Florida's education policies and practices. It will allow FLDOE to determine best practices to highlight with the Local Education Agencies and to identify potential program/policy areas in need of attention before they become an issue.

C-3: TIMELINE OF SLDS FEDERAL GRANT ACTIVITIES

Related to Florida's Statewide Longitudinal Data Systems



*Note: Years are based on the calendar year. Q1=Jan, Feb, Mar; Q2=Apr, May, Jun; Q3=Jul, Aug, Sep; Q4=Oct, Nov, Dec

C-4 - Section (C) Initiative Summary Chart

Federal Requirement	Initiative	Outcomes	Total Budget
(C)(1) Fully implementing a statewide longitudinal data system	Contingency budget for SLDS R4 if Florida does not win	This requirement is met through the implementation of Florida's PK-20 Education Data Warehouse.	$ 9,975,288
		Subtotal	$ 9,975,288
(C)(2) Accessing and using State data			
(C)(2) - Initiative 1	Implement Program and Technology Governance.	By 2012, create and implement state program and technology governance policies and processes that align the collection and definition of data with access and use of state data resources.	$ 150,000
(C)(2) - Initiaitive 2	Pre-populate state applications and reports with state data.	By 2013, automatically pre-populate state applications and reports with state data to increase accuracy, effectiveness, and process efficiencies for educators.	
(C)(2) - Initiative 3	Provide a single, customer-friendly Web-based interface to state data resources.	By mid 2012, create an engaging and informative, customer-friendly, Web-based interface for education stakeholders that is intuitive, easy to navigate, and relevant.	
(C)(2) - Initiative 4	Provide simple access to confidential data and applications.	By 2013, provide authorized users with single sign-on access to confidential student and staff information through the customer-friendly, Web-based interface to increase data access and use.	
(C)(2) - Initiative 5	Publish relevant reports and information from state data resources	By 2014, publish state reports and information for education stakeholders that are intuitive, easy to navigate, and relevant.	$ 44,228,740
		Subtotal	$ 44,378,740
(C)(3) Using data to improve instruction			
(i) Increase the acquisition, adoption, and use of local instructional improvement systems			
(C)(3)(i) - Initiative 1	Require LEAs that do not have an instructional improvement system to acquire one.	By 2014, LEAs that do not currently have an instructional improvement system will acquire one.	$ -
(C)(3)(i) - Initiative 2	Publish state data for incorporation into local instructional improvement systems	By 2013, publish state data for incorporation into local instructional improvement systems.	Included with (C)(2) Initiatives 2 - 5
(ii) Support participating LEAs that are using instructional improvement systems in providing effective professional development			
(C)(3)(ii) - Initiative 3	Create multi-media professional development materials to support participating LEAs' effective professional development efforts.	By 2014, create multi-media professional development materials that encourage understanding and use of the customer-friendly, Web-based interface and state data resources.	$ 2,082,750
(C)(3)(ii) - Initiative 4	Prepare LEA professional development staff to train local users to understand and use state data resources.	By 2014, provide professional development specialists to work directly with participating LEAs in a train-the-trainer model to ensure LEA professional development staffs are well equipped to train local users to understand and use state data resources.	$ 1,997,000
(iii) Make the data from instructional improvement systems, together with statewide longitudinal data system data, available and accessible to researchers			
(C)(3)(iii) - Initiative 5	Provide data for research from the state and the local instructional improvements systems.	By 2011, enhance support of the research community by making data from state and local instructional improvement systems available. Establish a research agenda consistent with Florida's RTTT initiatives and student achievement goals.	$ -
		Subtotal	$ 4,079,750
		Total Budget	$ 58,433,778

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
American College of Education	Educational Leadership	Master's
Barry University	Educational Leadership	Master's
Barry University	Elementary Education/ESOL	Bachelor's
Barry University	Elementary Education/ESOL	Master's
Barry University	Elementary Education/ESOL/Reading	Bachelor's
Barry University	Endorsement: Reading	Endorsement
Barry University	Exceptional Student Education/ESOL	Bachelor's
Barry University	Exceptional Student Education/ESOL	Master's
Barry University	Exceptional Student Education/ESOL/Reading	Bachelor's
Barry University	Guidance and Counseling	Master's
Barry University	Physical Education	Bachelor's
Barry University	PreK/Primary Education/ESOL	Bachelor's
Barry University	PreK/Primary Education/ESOL	Master's
Barry University	Reading	Master's
Barry University	School Psychologist	Specialist
Bethune-Cookman University	Biology	Bachelor's
Bethune-Cookman University	Business Education	Bachelor's
Bethune-Cookman University	Chemistry	Bachelor's
Bethune-Cookman University	Elementary Education/ESOL	Bachelor's
Bethune-Cookman University	English/ESOL	Bachelor's
Bethune-Cookman University	Exceptional Student Education/ESOL	Bachelor's
Bethune-Cookman University	Music	Bachelor's
Bethune-Cookman University	Physical Education	Bachelor's
Bethune-Cookman University	Physics	Bachelor's
Bethune-Cookman University	Social Science	Bachelor's
Brevard Community College	Educator Preparation Institute	Post Baccalaureate
Broward State College	Educator Preparation Institute	Post Baccalaureate
Central Florida Community College		
Chipola College	Biology	Bachelor's
Chipola College	Educator Preparation Institute	Post Baccalaureate
Chipola College	Mathematics	Bachelor's
Chipola College	MG General Science	Bachelor's
Chipola College	MG Mathematics	Bachelor's
Clearwater Christian College	Biology	Bachelor's
Clearwater Christian College	Elementary Education/ESOL	Bachelor's
Clearwater Christian College	Elementary Education/ESOL/Reading	Bachelor's
Clearwater Christian College	Endorsement: Reading	Endorsement
Clearwater Christian College	English/ESOL	Bachelor's
Clearwater Christian College	Exceptional Student Education/ESOL	Bachelor's
Clearwater Christian College	Mathematics	Bachelor's
Clearwater Christian College	Music	Bachelor's
Clearwater Christian College	Physical Education	Bachelor's
Clearwater Christian College	Social Science	Bachelor's
Daytona State College	Biology	Bachelor's
Daytona State College	Chemistry	Bachelor's
Daytona State College	Earth/Space Science	Bachelor's
Daytona State College	Educator Preparation Institute	Post Baccalaureate

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
Daytona State College	Elementary Education/ESOL/Reading	Bachelor's
Daytona State College	Exceptional Student Education/ESOL/Reading	Bachelor's
Daytona State College	Mathematics	Bachelor's
Daytona State College	Physics	Bachelor's
Edison State College	Educator Preparation Institute	Post Baccalaureate
Edison State College	Elementary Education/ESOL/Reading	Bachelor's
Edward Waters College	Elementary Education/ESOL	Bachelor's
Flagler College	Art	Bachelor's
Flagler College	Drama	Bachelor's
Flagler College	Elementary Ed/Except Student Ed/ESOL	Bachelor's
Flagler College	Elementary Ed/Hearing Impaired/ESOL	Bachelor's
Flagler College	Elementary Education/ESOL	Bachelor's
Flagler College	Elementary Education/ESOL/Reading	Bachelor's
Flagler College	Elementary Education/Hearing Impaired/ESOL/Reading	Bachelor's
Flagler College	English/ESOL	Bachelor's
Flagler College	Exceptional Student Education/ESOL/Reading	Bachelor's
Flagler College	Social Science	Bachelor's
Florida A&M University	Art	Bachelor's
Florida A&M University	Biology	Bachelor's
Florida A&M University	Business Education	Bachelor's
Florida A&M University	Chemistry	Bachelor's
Florida A&M University	Drama	Bachelor's
Florida A&M University	Educational Leadership	Master's
Florida A&M University	Elementary Education/ESOL	Bachelor's
Florida A&M University	Endorsement: Reading	Endorsement
Florida A&M University	English/ESOL	Bachelor's
Florida A&M University	Exceptional Student Education/ESOL	Bachelor's
Florida A&M University	Guidance and Counseling	Master's
Florida A&M University	Mathematics	Bachelor's
Florida A&M University	Music	Bachelor's
Florida A&M University	Physical Education	Bachelor's
Florida A&M University	Physics	Bachelor's
Florida A&M University	PreK-Primary Education/ESOL	Bachelor's
Florida A&M University	Professional Training Option	n/a
Florida A&M University	School Psychologist	Specialist
Florida A&M University	Social Science	Bachelor's
Florida Atlantic University	Art	Bachelor's
Florida Atlantic University	Biology	Bachelor's
Florida Atlantic University	Chemistry	Bachelor's
Florida Atlantic University	Educational Leadership	Master's
Florida Atlantic University	Elementary Education/ESOL	Bachelor's
Florida Atlantic University	Elementary Education/ESOL	Master's
Florida Atlantic University	English/ESOL	Bachelor's
Florida Atlantic University	Exceptional Student Education/ESOL	Bachelor's
Florida Atlantic University	Exceptional Student Education/ESOL	Master's
Florida Atlantic University	French	Bachelor's

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
Florida Atlantic University	German	Bachelor's
Florida Atlantic University	Guidance and Counseling	Master's
Florida Atlantic University	Mathematics	Bachelor's
Florida Atlantic University	Music	Bachelor's
Florida Atlantic University	Physics	Bachelor's
Florida Atlantic University	Reading	Master's
Florida Atlantic University	Social Science	Bachelor's
Florida Atlantic University	Spanish	Bachelor's
Florida College	Elementary Education/ESOL Endor.	Bachelor's
Florida Gulf Coast University	Biology	Bachelor's
Florida Gulf Coast University	Educational Leadership	Master's
Florida Gulf Coast University	Educator Preparation Institute	Post Baccalaureate
Florida Gulf Coast University	Elementary Education/ESOL Endorsement	Bachelor's
Florida Gulf Coast University	Exceptional Student Education/ESOL Endorsement	Bachelor's
Florida Gulf Coast University	Guidance and Counseling	Master's
Florida Gulf Coast University	Mathematics	Bachelor's
Florida Gulf Coast University	PreK-Primary Ed/PreK Disabilities Endorsement/ESOL Endorsement	Bachelor's
Florida Gulf Coast University	Preschool/PreK Prim/PreK Disab Endorsement/ESOL Endorsement	Bachelor's
Florida Gulf Coast University	Professional Training Option	n/a
Florida Gulf Coast University	Reading	Master's
Florida Gulf Coast University	Social Science	Bachelor's
Florida Institute of Technology	Biology	Bachelor's
Florida Institute of Technology	Chemistry	Bachelor's
Florida Institute of Technology	Earth/Space Science	Bachelor's
Florida Institute of Technology	Mathematics	Bachelor's
Florida Institute of Technology	MG General Science	Bachelor's
Florida Institute of Technology	MG Mathematics	Bachelor's
Florida Institute of Technology	MG Mathematics/MG Science	Bachelor's
Florida Institute of Technology	Physics	Bachelor's
Florida International University	Art	Bachelor's
Florida International University	Art (MAT)	Master's
Florida International University	Biology	Bachelor's
Florida International University	Biology (MAT)	Master's
Florida International University	Chemistry	Bachelor's
Florida International University	Chemistry (MAT)	Master's
Florida International University	Educational Leadership	Master's
Florida International University	Elementary Education/ESOL	Bachelor's
Florida International University	Endorsement: Reading	Endorsement
Florida International University	Endorsement:ESOL	Endorsement
Florida International University	English/ESOL	Bachelor's
Florida International University	English/ESOL (MAT)	Master's
Florida International University	Exceptional Student Education/ESOL	Bachelor's
Florida International University	Exceptional Student Education/ESOL (MAT)	Master's
Florida International University	French	Bachelor's
Florida International University	French (MAT)	Master's

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
Florida International University	Guidance and Counseling	Master's
Florida International University	Mathematics	Bachelor's
Florida International University	Mathematics (MAT)	Master's
Florida International University	Music	Bachelor's
Florida International University	Physical Education	Bachelor's
Florida International University	Physics	Bachelor's
Florida International University	Physics (MAT)	Master's
Florida International University	PreK/Primary Education/ESOL	Bachelor's
Florida International University	Professional Training Option	n/a
Florida International University	Reading	Master's
Florida International University	School Psychologist	Specialist
Florida International University	Social Science	Bachelor's
Florida International University	Social Science (MAT)	Master's
Florida International University	Spanish	Bachelor's
Florida International University	Spanish (MAT)	Master's
Florida Keys Community College	Educator Preparation Institute	Post Baccalaureate
Florida Memorial University	Biology	Bachelor's
Florida Memorial University	Elementary Education/ESOL	Bachelor's
Florida Memorial University	Elementary Education/ESOL	Master's
Florida Memorial University	English/ESOL	Bachelor's
Florida Memorial University	Exceptional Student Education/ESOL	Bachelor's
Florida Memorial University	Mathematics	Bachelor's
Florida Memorial University	MG English/ESOL	Bachelor's
Florida Memorial University	MG General Science	Bachelor's
Florida Memorial University	MG Mathematics	Bachelor's
Florida Memorial University	Music	Bachelor's
Florida Memorial University	Physical Education	Bachelor's
Florida Memorial University	Reading/ESOL	Master's
Florida Southern College	Art	Bachelor's
Florida Southern College	Biology	Bachelor's
Florida Southern College	Elementary Education/ESOL	Bachelor's
Florida Southern College	English	Bachelor's
Florida Southern College	Exceptional Student Education/ESOL	Bachelor's
Florida Southern College	Mathematics	Bachelor's
Florida Southern College	Music	Bachelor's
Florida Southern College	Physical Education	Bachelor's
Florida Southern College	PreK/Primary Education/ESOL	Bachelor's
Florida Southern College	Social Science	Bachelor's
Florida Southern College	Spanish	Bachelor's
Florida State College at Jacksonville		
Florida State University	Art	Bachelor's
Florida State University	Art	Master's
Florida State University	Biology	Bachelor's
Florida State University	Biology	Master's
Florida State University	Biology (MST)	Master's
Florida State University	Biology/Chemistry	Bachelor's
Florida State University	Biology/Earth Space Science	Bachelor's

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
Florida State University	Chemistry	Bachelor's
Florida State University	Chemistry	Master's
Florida State University	Chemistry (MST)	Master's
Florida State University	Earth/Space Science	Bachelor's
Florida State University	Earth/Space Science	Master's
Florida State University	Educational Leadership	Master's
Florida State University	Educational Media Specialist	Master's
Florida State University	Elementary Education	Master's
Florida State University	Elementary Education/ESOL	Bachelor's
Florida State University	Elementary Education/ESOL	Master's
Florida State University	Elementary Education/ESOL/Reading	Bachelor's
Florida State University	Elementary Education/ESOL/Reading	Master's
Florida State University	English	Bachelor's
Florida State University	English/ESOL	Bachelor's
Florida State University	Exceptional Student Education/ESOL	Master's
Florida State University	Family and Consumer Science	Bachelor's
Florida State University	French	Bachelor's
Florida State University	German	Bachelor's
Florida State University	Guidance and Counseling	Master's
Florida State University	Health	Bachelor's
Florida State University	Mathematics	Bachelor's
Florida State University	Mathematics/Physics	Bachelor's
Florida State University	Mathematics/Statistics	Bachelor's
Florida State University	MG General Science	Bachelor's
Florida State University	MG General Science	Master's
Florida State University	MG Mathematics	Bachelor's
Florida State University	Music	Bachelor's
Florida State University	Music	Master's
Florida State University	Physical Education	Bachelor's
Florida State University	Physical Education	Master's
Florida State University	Physics	Bachelor's
Florida State University	Physics	Master's
Florida State University	Physics/Chemistry	Bachelor's
Florida State University	Physics/Earth Space Science	Bachelor's
Florida State University	PreK/Primary Education	Master's
Florida State University	PreK-Primary Education/ ESOL	Bachelor's
Florida State University	Professional Training Option	n/a
Florida State University	Reading	Master's
Florida State University	School Psychologist	Master's
Florida State University	Social Science/MG Social Science	Bachelor's
Florida State University	Social Science/MG Social Science	Master's
Florida State University	Spanish	Bachelor's
Florida State University	Speech/Lang Impaired	Master's
Florida State University	Visually Impaired	Bachelor's
Florida State University	Visually Impaired	Master's
Gulf Coast Community College	Educator Preparation Institute	Post Baccalaureate
Hillsborough Community College	Educator Preparation Institute	Post Baccalaureate

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
Indian River State College	Biology	Bachelor's
Indian River State College	Educator Preparation Institute	Post Baccalaureate
Indian River State College	Exceptional Student Education/ESOL/Reading	Bachelor's
Indian River State College	Mathematics	Bachelor's
Indian River State College	MG General Science	Bachelor's
Indian River State College	MG Mathematics	Bachelor's
Jacksonville University	Educational Leadership	Master's
Jacksonville University	Elementary Education/ESOL/Reading	Master's
Jacksonville University	Physical Education	Master's
Lake City Community College	Educator Preparation Institute	Post Baccalaureate
Lake Sumter Community College	Educator Preparation Institute	Post Baccalaureate
Lynn University	Educational Leadership	Master's
Lynn University	Elementary Education	Bachelor's
Lynn University	English	Bachelor's
Lynn University	PreK-Primary Education	Bachelor's
Lynn University	Social Science	Bachelor's
Miami-Dade College	Biology	Bachelor's
Miami-Dade College	Chemistry	Bachelor's
Miami-Dade College	Earth/Space Science	Bachelor's
Miami-Dade College	Educator Preparation Institute	Post Baccalaureate
Miami-Dade College	Exceptional Student Education	Bachelor's
Miami-Dade College	Mathematics	Bachelor's
Miami-Dade College	Physics	Bachelor's
National-Louis University	Educational Leadership	Master's
North Florida Community College	Educator Preparation Institute	Post Baccalaureate
Northwest State College	Educator Preparation Institute	Post Baccalaureate
Northwest State College	Elementary Education/ESOL/Reading	Bachelor's
Northwest State College	Middle Grades General Science	Bachelor's
Northwest State College	Middle Grades Mathematics	Bachelor's
Nova Southeastern University	Biology	Bachelor's
Nova Southeastern University	Computer Science	Master's
Nova Southeastern University	Educational Leadership	Specialist
Nova Southeastern University	Educational Leadership	Master's
Nova Southeastern University	Educational Media Specialist	Master's
Nova Southeastern University	Elementary Education/ESOL	Bachelor's
Nova Southeastern University	Elementary Education/ESOL	Master's
Nova Southeastern University	Endorsement: Gifted	Endorsement
Nova Southeastern University	Endorsement: Pre-K Disabilities	Endorsement
Nova Southeastern University	Endorsement: Reading	Endorsement
Nova Southeastern University	Endorsement:ESOL	Endorsement
Nova Southeastern University	English/ESOL	Master's
Nova Southeastern University	English/ESOL	Bachelor's
Nova Southeastern University	Exceptional Student Education/ESOL	Bachelor's
Nova Southeastern University	Exceptional Student Education/ESOL	Master's
Nova Southeastern University	Mathematics	Bachelor's
Nova Southeastern University	Mathematics	Master's
Nova Southeastern University	MG General Science	Master's

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
Nova Southeastern University	MG General Science	Bachelor's
Nova Southeastern University	MG Mathematics	Master's
Nova Southeastern University	MG Social Science	Bachelor's
Nova Southeastern University	MG Social Science	Master's
Nova Southeastern University	Middle Grades English/ESOL	Bachelor's
Nova Southeastern University	Middle Grades English/ESOL	Master's
Nova Southeastern University	PreK-Primary Education/ESOL	Bachelor's
Nova Southeastern University	PreK-Primary Education/ESOL	Master's
Nova Southeastern University	Reading	Master's
Nova Southeastern University	School Psychologist	Specialist
Nova Southeastern University	Social Science	Bachelor's
Nova Southeastern University	Social Science	Master's
Nova Southeastern University	Spanish	Master's
Nova Southeastern University	Speech/Lang Impaired	Master's
Palm Beach Atlantic University	Art	Bachelor's
Palm Beach Atlantic University	Biology	Bachelor's
Palm Beach Atlantic University	Drama	Bachelor's
Palm Beach Atlantic University	Elementary Ed/Except Student Ed/ESOL	Bachelor's
Palm Beach Atlantic University	Elementary Ed/MG English/ESOL	Bachelor's
Palm Beach Atlantic University	Elementary Ed/MG Gen Science/ESOL	Bachelor's
Palm Beach Atlantic University	Elementary Ed/MG Math/ESOL	Bachelor's
Palm Beach Atlantic University	Elementary Ed/MG Social Science/ESOL	Bachelor's
Palm Beach Atlantic University	Elementary Education/ESOL	Bachelor's
Palm Beach Atlantic University	Elementary Education/ESOL	Master's
Palm Beach Atlantic University	English	Bachelor's
Palm Beach Atlantic University	English/ESOL	Bachelor's
Palm Beach Atlantic University	Mathematics	Bachelor's
Palm Beach Atlantic University	Music	Bachelor's
Palm Beach Atlantic University	Physical Education	Bachelor's
Palm Beach Atlantic University	PreK-Primary/Elementary Ed/ESOL	Bachelor's
Palm Beach Atlantic University	Professional Training Option	n/a
Palm Beach Atlantic University	Social Science	Bachelor's
Palm Beach Community College	Educator Preparation Institute	Post Baccalaureate
Pasco-Hernando Community College		
Pensacola Junior College	Educator Preparation Institute	Post Baccalaureate
Polk State College	Educator Preparation Institute	Post Baccalaureate
Rollins College	Biology	Bachelor's
Rollins College	Chemistry	Bachelor's
Rollins College	Drama	Bachelor's
Rollins College	Elementary Education/ESOL	Bachelor's
Rollins College	Elementary Education/ESOL	Master's
Rollins College	English/ESOL	Bachelor's
Rollins College	French	Bachelor's
Rollins College	Mathematics	Bachelor's
Rollins College	Music	Bachelor's
Rollins College	Physics	Bachelor's
Rollins College	Social Science	Bachelor's

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
Rollins College	Spanish	Bachelor's
Saint Leo University	Educational Leadership	Master's
Saint Leo University	Elementary Education/ESOL	Bachelor's
Saint Leo University	Elementary Education/ESOL/Reading	Bachelor's
Saint Leo University	Exceptional Student Education	Master's
Saint Leo University	Exceptional Student Education/ESOL/Reading	Master's
Saint Leo University	MG English/ESOL/Reading	Bachelor's
Saint Leo University	MG General Science (MAT)	Master's
Saint Leo University	MG General Science/Reading	Bachelor's
Saint Leo University	MG Mathematics (MAT)	Master's
Saint Leo University	MG Mathematics/Reading	Bachelor's
Saint Leo University	MG Social Science (MAT)	Master's
Saint Leo University	MG Social Science/Reading	Bachelor's
Santa Fe College	Educator Preparation Institute	Post Baccalaureate
Seminole Community College	Educator Preparation Institute	Post Baccalaureate
South Florida Community College	Educator Preparation Institute	Post Baccalaureate
Southeastern University	Biology	Bachelor's
Southeastern University	Educational Leadership	Master's
Southeastern University	Elementary Education/ESOL	Bachelor's
Southeastern University	Elementary Education/ESOL/Reading	Bachelor's
Southeastern University	English/ESOL	Bachelor's
Southeastern University	Exceptional Student Education/ESOL/Reading	Bachelor's
Southeastern University	Mathematics	Bachelor's
Southeastern University	MG English/ESOL	Bachelor's
Southeastern University	MG General Science	Bachelor's
Southeastern University	MG Mathematics	Bachelor's
Southeastern University	MG Social Science	Bachelor's
Southeastern University	Music	Bachelor's
Southeastern University	Social Science	Bachelor's
St. Johns River Community College		
St. Petersburg College	Biology	Bachelor's
St. Petersburg College	Business Education	Bachelor's
St. Petersburg College	Educator Preparation Institute	Post Baccalaureate
St. Petersburg College	Elementary Education/ESOL	Bachelor's
St. Petersburg College	Elementary Education/ESOL/Reading	Bachelor's
St. Petersburg College	Exceptional Student Education/ESOL	Bachelor's
St. Petersburg College	Exceptional Student Education/ESOL/Reading	Bachelor's
St. Petersburg College	Mathematics	Bachelor's
St. Petersburg College	Middle Grades General Science	Bachelor's
St. Petersburg College	Middle Grades Mathematics	Bachelor's
St. Petersburg College	Technology Education	Bachelor's
State College of Florida, Manatee-Sarasota		
Stetson University	Biology	Bachelor's
Stetson University	Educational Leadership	Master's
Stetson University	Elementary Education/ESOL	Bachelor's
Stetson University	Endorsement: Reading	Endorsement
Stetson University	English/ESOL	Bachelor's

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
Stetson University	Exceptional Student Education/ESOL	Master's
Stetson University	French	Bachelor's
Stetson University	German	Bachelor's
Stetson University	Guidance and Counseling	Master's
Stetson University	Mathematics	Bachelor's
Stetson University	Music	Bachelor's
Stetson University	Reading	Master's
Stetson University	Social Science	Bachelor's
Stetson University	Spanish	Bachelor's
Tallahassee Community College	Educator Preparation Institute	Post Baccalaureate
University of Central Florida	Art	Bachelor's
University of Central Florida	Art	Master's
University of Central Florida	Biology	Bachelor's
University of Central Florida	Biology	Master's
University of Central Florida	Chemistry	Bachelor's
University of Central Florida	Chemistry	Master's
University of Central Florida	Educational Leadership	Master's
University of Central Florida	Educational Media Specialist	Master's
University of Central Florida	Elementary Education/ESOL	Bachelor's
University of Central Florida	Elementary Education/ESOL	Master's
University of Central Florida	Elementary Education/ESOL/Reading	Bachelor's
University of Central Florida	Endorsement: Autism	Endorsement
University of Central Florida	Endorsement:ESOL	Endorsement
University of Central Florida	English/ESOL	Bachelor's
University of Central Florida	English/ESOL	Master's
University of Central Florida	Exceptional Student Education/ESOL	Bachelor's
University of Central Florida	Exceptional Student Education/ESOL	Master's
University of Central Florida	Exceptional Student Education/ESOL/Reading	Bachelor's
University of Central Florida	French	Bachelor's
University of Central Florida	Guidance and Counseling	Master's
University of Central Florida	Mathematics	Bachelor's
University of Central Florida	Mathematics	Master's
University of Central Florida	MG General Science	Master's
University of Central Florida	MG Mathematics	Master's
University of Central Florida	Music	Bachelor's
University of Central Florida	Music	Master's
University of Central Florida	Physical Education	Bachelor's
University of Central Florida	Physics	Bachelor's
University of Central Florida	Physics	Master's
University of Central Florida	PreK/Primary Education/ESOL	Bachelor's
University of Central Florida	Pre-K/Primary/ESOL/Reading	Bachelor's
University of Central Florida	Professional Training Option	n/a
University of Central Florida	Reading	Master's
University of Central Florida	School Psychologist	Specialist
University of Central Florida	Social Science	Bachelor's
University of Central Florida	Social Science	Master's
University of Central Florida	Spanish	Bachelor's

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
University of Florida	Agriculture	Bachelor's
University of Florida	Agriculture	Master's
University of Florida	Art	Bachelor's
University of Florida	Biology	Master's
University of Florida	Chemistry	Master's
University of Florida	Educational Leadership	Master's
University of Florida	Educator Preparation Institute	Post Baccalaureate
University of Florida	Educator Preparation Institute	Master's
University of Florida	Elementary Ed/Except Student Ed/ESOL	Master's
University of Florida	Elementary Ed/Except Student Ed/ESOL	Post Baccalaureate
University of Florida	Elementary Education/ESOL	Master's
University of Florida	Elementary Education/ESOL	Post Baccalaureate
University of Florida	Endorsement:ESOL	Endorsement
University of Florida	English	Master's
University of Florida	English/ESOL	Master's
University of Florida	Guidance and Counseling	Specialist
University of Florida	Music	Bachelor's
University of Florida	Physical Education	Bachelor's
University of Florida	Physics	Master's
University of Florida	Preschool Ed/PreK-Primary Ed/PreK Disabilities/ESO	Master's
University of Florida	Preschool Ed/PreK-Primary Ed/PreK Disabilities/ESO	Post Baccalaureate
University of Florida	Professional Training Option	n/a
University of Florida	Reading	Master's
University of Florida	School Psychologist	Doctorate
University of Florida	School Psychologist	Specialist
University of Florida	Social Science	Master's
University of Miami	Biology	Bachelor's
University of Miami	Chemistry	Bachelor's
University of Miami	Elementary Education/ESOL	Bachelor's
University of Miami	Elementary Education/ESOL	Master's
University of Miami	Endorsement: Reading	Endorsement
University of Miami	English/ESOL	Bachelor's
University of Miami	Exceptional Student Education/ESOL	Bachelor's
University of Miami	Exceptional Student Education/PreK Disab/ESOL	Master's
University of Miami	Exceptional Student Education/Reading/ESOL	Master's
University of Miami	Mathematics	Bachelor's
University of Miami	Music	Bachelor's
University of Miami	Music	Master's
University of Miami	Professional Training Option	n/a
University of Miami	Reading/ESOL	Master's
University of Miami	Social Science	Bachelor's
University of North Florida	Art	Bachelor's
University of North Florida	Biology	Bachelor's
University of North Florida	Chemistry	Bachelor's
University of North Florida	Educational Leadership	Master's
University of North Florida	Educator Preparation Institute	Post Baccalaureate

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
University of North Florida	Elementary Education/ESOL	Bachelor's
University of North Florida	Elementary Education/ESOL	Master's
University of North Florida	Endorsement: Reading	Endorsement
University of North Florida	English/ESOL	Bachelor's
University of North Florida	Exceptional Student Education/ESOL	Bachelor's
University of North Florida	Exceptional Student Education/ESOL	Master's
University of North Florida	Guidance and Counseling	Master's
University of North Florida	Hearing Impaired	Master's
University of North Florida	Mathematics	Bachelor's
University of North Florida	MG Math/MG General Science	Bachelor's
University of North Florida	Music	Bachelor's
University of North Florida	Physical Education	Bachelor's
University of North Florida	Physics	Bachelor's
University of North Florida	PreK/Primary Education/ESOL	Bachelor's
University of North Florida	Social Science	Bachelor's
University of South Florida	Biology	Bachelor's
University of South Florida	Biology (MAT)	Master's
University of South Florida	Chemistry	Bachelor's
University of South Florida	Chemistry (MAT)	Master's
University of South Florida	Chinese/ESOL (MAT)	Master's
University of South Florida	Educational Leadership	Master's
University of South Florida	Elementary Education/ESOL	Bachelor's
University of South Florida	Elementary Education/ESOL (MAT)	Master's
University of South Florida	Endorsement: Reading	Endorsement
University of South Florida	Endorsement:Gifted	Endorsement
University of South Florida	English/ESOL	Bachelor's
University of South Florida	English/ESOL (MAT)	Master's
University of South Florida	Exceptional Student Ed./ESOL/Reading (MAT)	Master's
University of South Florida	Exceptional Student Education/ESOL	Bachelor's
University of South Florida	Exceptional Student Education/ESOL (MAT)	Master's
University of South Florida	Exceptional Student Education/ESOL/Reading	Bachelor's
University of South Florida	French/ESOL	Bachelor's
University of South Florida	French/ESOL (MAT)	Master's
University of South Florida	German/ESOL	Bachelor's
University of South Florida	German/ESOL (MAT)	Master's
University of South Florida	Guidance and Counseling	Master's
University of South Florida	Italian/ESOL	Bachelor's
University of South Florida	Italian/ESOL (MAT)	Master's
University of South Florida	Japanese/ESOL (MAT)	Master's
University of South Florida	Latin/ESOL	Bachelor's
University of South Florida	Latin/ESOL (MAT)	Master's
University of South Florida	Mathematics	Bachelor's
University of South Florida	Mathematics (MAT)	Master's
University of South Florida	MG Mathematics (MAT)	Master's
University of South Florida	Music	Bachelor's
University of South Florida	Physical Education	Bachelor's
University of South Florida	Physics	Bachelor's

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
University of South Florida	Physics (MAT)	Master's
University of South Florida	PreK-Primary Education/ ESOL	Bachelor's
University of South Florida	Reading	Master's
University of South Florida	Russian/ESOL	Bachelor's
University of South Florida	Russian/ESOL (MAT)	Master's
University of South Florida	School Psychologist	Specialist
University of South Florida	Social Science	Bachelor's
University of South Florida	Social Science (MAT)	Master's
University of South Florida	Spanish/ESOL	Bachelor's
University of South Florida	Spanish/ESOL (MAT)	Master's
University of South Florida - St. Petersburg	Educational Leadership	Master's
University of South Florida - St. Petersburg	Elementary Education/ ESE/ESOL/Reading	Bachelor's
University of South Florida - St. Petersburg	Elementary Education/ESOL	Master's
University of South Florida - St. Petersburg	Professional Training Option	n/a
University of South Florida-St. Petersburg	Reading	Master's
University of Tampa	Biology	Bachelor's
University of Tampa	Biology (MAT)	Master's
University of Tampa	Chemistry (MAT)	Master's
University of Tampa	Elementary Education/ESOL	Bachelor's
University of Tampa	English/ESOL	Bachelor's
University of Tampa	Mathematics	Bachelor's
University of Tampa	Mathematics (MAT)	Master's
University of Tampa	MG Mathematics (MAT)	Master's
University of Tampa	Music	Bachelor's
University of Tampa	Physical Education	Bachelor's
University of Tampa	Physics (MAT)	Master's
University of Tampa	Social Science	Bachelor's
University of West Florida	Biology	Master's
University of West Florida	Chemistry	Master's
University of West Florida	Educational Leadership	Master's
University of West Florida	Educator Preparation Institute	Post Baccalaureate
University of West Florida	Elementary Education/ESOL	Bachelor's
University of West Florida	Elementary Education/ESOL	Master's
University of West Florida	Elementary Education/ESOL/Reading	Bachelor's
University of West Florida	Endorsement: Reading	Endorsement
University of West Florida	English	Master's
University of West Florida	Exceptional Student Education/ESOL	Master's
University of West Florida	Exceptional Student Education/ESOL	Bachelor's
University of West Florida	Exceptional Student Education/ESOL/Reading	Bachelor's
University of West Florida	Mathematics	Master's
University of West Florida	MG English	Master's
University of West Florida	MG English/MG Social Science	Bachelor's
University of West Florida	MG Gen Sci/English	Bachelor's

D-1 - LIST OF INSTITUTIONS OFFERING AN EPI AND PROFESSIONAL TRAINING OPTION

Agency	Program	Degree Level
University of West Florida	MG Gen Sci/Social Science	Bachelor's
University of West Florida	MG General Science	Master's
University of West Florida	MG Math/English	Bachelor's
University of West Florida	MG Math/MG General Science	Bachelor's
University of West Florida	MG Math/Social Science	Bachelor's
University of West Florida	MG Mathematics	Master's
University of West Florida	MG Social Science	Master's
University of West Florida	Physics	Master's
University of West Florida	PreK/Primary Education/ESOL	Bachelor's
University of West Florida	Pre-K/Primary/ESOL/Reading	Bachelor's
University of West Florida	Professional Training Option	n/a
University of West Florida	Reading	Master's
University of West Florida	Social Science	Master's
University of West Florida	Technology Education	Bachelor's
University of West Florida	Technology Education	Master's
University South Florida - St.Petersburg	Exceptional Student Education/ESOL (MAT)	Master's
Valenica Community College	Educator Preparation Institute	Post Baccalaureate
Warner University	Elementary Education/ESOL	Bachelor's
Warner University	English/ESOL	Bachelor's
Warner University	Exceptional Student Education/ESOL	Bachelor's
Warner University	MG General Science	Bachelor's
Warner University	Music	Bachelor's
Warner University	Physical Education	Bachelor's
Warner University	Social Science	Bachelor's

D-2
ANNUAL REPORT, CRITICAL TEACHER SHORTAGE AREAS
2010-2011

November 2009

Office of Research and Evaluation
Florida Department of Education

For more information contact:
Office of Research and Evaluation
Florida Department of Education
(850) 245-0429
martha.miller@fldoe.org

METHODOLOGY FOR THE IDENTIFICATION OF TEACHER SHORTAGE AREAS 2010-11

Section 1012.07, Florida Statutes, requires that the State Board of Education annually identify critical teacher shortage areas. This list of shortage areas is used in implementing the Critical Teacher Shortage Tuition Reimbursement Program and the Critical Teacher Shortage Student Loan Forgiveness Program. State Board of Education Rule 6A-20.0131(2) further provides that:

> *(1) On or before December 1 of each year, the Commissioner shall recommend to the State Board for approval the specific teaching areas and high priority locations in which critical teacher shortages are projected for the public schools during the year following the academic year in which approval is made.*
>
> *(2) In accordance with procedures approved by the Commissioner, a list of critical teacher shortage areas shall be prepared based on consideration of current supply and demand information related to Florida public school instructional personnel including but not limited to:*
> *(a) The number and percentage of vacant positions in each teaching discipline;*
> *(b) The number and percentage of positions filled by teachers not certified in the appropriate field;*
> *(c) The projected annual supply of graduates of state approved Florida teacher education programs for each discipline.*

Based on the information outlined above, the following subject fields have been designated by the State Board of Education as critical teacher shortage areas for 2010-11.[1]

- **middle and high school level mathematics;**
- **middle and high school level science;**
- **middle and high school level English/language arts;**
- **reading;**
- **all exceptional student education programs;**
- **English for speakers of other languages (ESOL);**
- **foreign languages; and**
- **technology education/industrial arts.**

Shortages During Fall 2008

The Department of Education surveys the school districts each fall to determine the number of teaching positions filled from July 1st to October 1st. Survey results provide two indicators of fields currently facing critical shortages which include: (1) the number of new hires as a percentage of teachers in each field and (2) the number of positions filled by teachers who lack appropriate certification.[2]

---

[1] See page 12 for a list of critical teacher shortage areas for 1984-85 through 2010-11.

[2] New hires are new to the district, but may have taught in another district in prior years and, therefore, may not be new to Florida public schools.

Number of New Hires

The fall 2008 New Hires Survey indicates that districts hired 10,604 classroom teachers and 542 other instructional personnel between July 1st and October 1st. These numbers are 44 percent lower than the prior year (18,930).

The new hires represented 6.3 percent of all classroom teachers teaching in fall 2008, compared to 11 percent in 2007 and 13 percent in 2006. (See Table 1.) This decrease in the number of new hires is doubtless a reflection of the economy, accompanied by a drop in revenues, the restructuring of courses and the school day in some districts, a delay in requiring districts to meet class size targets at the classroom level, and teacher layoffs.

Table 2 shows the number of new hires as a percentage of the estimated number of teachers for the critical teacher shortage areas. New hires in autism represented 10 percent of the total number of teachers in that field. English and science represented 8 percent.

Table 1
Number of Fall New Hires – Classroom Teachers

	2003	2004	2005	2006	2007	2008
Fall New Hires	19,317	20,010	21,919	21,282	18,930	10,604
Classroom Teachers	149,128	158,625	164,665	168,181	172,215	168,938
As a Percentage of Teachers	13.0	12.6	13.3	12.7	11.0	6.3

Table 2
Number of New Hires Compared to Total Number of Teachers - Fall 2008
Critical Teacher Shortage Areas

Subject Field	New Hires	Estimated Number of Teachers	New Hires as a Percentage of Teachers
English./Lang. Arts	846	10,344	8.2
Math	729	11,188	6.5
Science	771	9,370	8.2
Reading	354	5,577	6.3
Foreign Languages	273	3,690	7.4
ESOL	113	2,826	4.0
Technology Educ./Industrial Arts	32	597	5.4
ESE (Varying Excep., etc.)	1,048	16,671	6.3
Speech/Language Impaired	194	2,596	7.5
Deaf or Hard of Hearing	20	414	4.8
Visually Impaired	9	238	3.8
Autism Spectrum Disorder	111	1,068	10.4
Occupational/Phyical Therapy	19	488	3.9
PreK Handicapped	59	1,275	4.6
Gifted	77	2,224	3.5
Exceptional Other	63	571	11.0
Total Exceptional	1,600	25,545	6.3

New-Hires Hired Out-of-Field

A second indicator of teacher shortages used to identify critical teacher shortage fields is the percentage of newly hired teachers who were not certified in the field that they were assigned to teach. Overall, 7.3 percent of the new hires in fall 2008 were not appropriately certified, the lowest in the last 10 years, and half the percentage out of field in 2000 through 2002. (See Table 3.)

Table 3
Percentage of New Hires
Not Certified in the Appropriate Field

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Basic Fields	12.8	10.2	13.1	12.3	8.9	8.9	8.6	10.1	9.0	7.0
Exceptional Student Educ.	27.3	30.0	31.8	29.9	22.1	19.8	15.1	16.7	14.5	9.1
Career Education	15.0	15.3	20.6	9.9	15.3	10.0	7.8	10.8	8.7	7.8
Total Classroom	15.6	14.2	16.9	15.8	11.5	10.7	9.6	11.1	9.8	7.3

Districts have reported that the decrease in the hiring out-of-field teachers that began about 2002 was due to:

- The emphasis on hiring only "highly qualified teachers," as defined by the federal No Child Left Behind Act of 2001. Districts began making a special effort to locate appropriately certified teachers.
- The focus on smaller classes in grades K-3, resulting in districts hiring significantly more teachers certified in elementary education. Teachers with this certification are typically easier to find than teachers certified in critical teacher shortage areas.
- The collapsing of such certification areas as mentally handicapped, specific learning disabled, emotionally handicapped, varying exceptionalities, and related fields into one category, ESE, making it easier to find appropriately certified teachers for these areas. Similarly, the change in elementary certification coverage from grades 1-6 to grades K-6 has made it easier to recruit kindergarten teachers in field.
- Statutes enabling teacher applicants to document mastery of subject area knowledge, required for issuance of a Temporary or Professional Certificate, by achieving a passing score on a subject area examination. This has expanded certification options to those with academic degrees who have not completed an approved teacher education program. (See section on Teacher Supply beginning on page 8.)

In addition to these reasons, the significant drop in 2008 may well be in response to the economy, as indicated above.

Despite recent decreases in out-of-field teachers in exceptional student education, the percentage continues to be higher than other areas. Nine percent of ESE teachers hired in fall 2008 were not certified in the appropriate field, compared to seven percent in other areas.

Table 4 displays information on the number of new hires in fall 2008 for each of the fields designated as critical teacher shortage areas. As shown in Column 3:

- 53 percent of the teachers hired to teach middle or high school reading were not appropriately certified. Teachers are considered in-field for teaching reading at the elementary level if they are certified in either elementary education or reading. Thus it is easier to fill positions in elementary reading than positions in reading at the middle or high school level.
- 40 percent of the teachers hired to teach the gifted were not appropriately certified. Principals sometimes fill such positions with experienced subject area teachers who lack course work in gifted, but who may later satisfy requirements for endorsement in this field.
- 25 percent of the new hires in technology education did not have appropriate certification.
- 12 to 17 percent of the new hires in ESOL, hearing impaired, autism, and foreign languages were hired out of field.
- 7 to 9 percent of the teachers hired to teach ESE and English were hired out-of-field.
- Typically, few out-of-field teachers are hired in the areas of speech pathology and occupational and physical therapy because of the highly specialized nature of these areas.

Table 4
New Hires Hired Out of Field
Critical Teacher Shortage Areas - Fall 2008

Subjects	New Hires	New Hires Who Were Not Certified in the Appropriate Field	
		Number	Percentage
Middle/Jr and Senior High Basic			
English/Lang. Arts	846	59	7.0
Math	729	33	4.5
Science	771	42	5.4
Reading	354	187	52.8
K-12			
Foreign Language	273	32	11.7
ESOL	113	19	16.8
Industrial Arts/Technology Educ	32	8	25.0
Exceptional Student Education			
ESE (Varying Excep, etc.)	1,048	92	8.8
Speech Impaired	194	2	1.0
Hearing Impaired	20	3	15.0
Visually Impaired	9	0	0.0
Autistic	111	15	13.5
Occupational/Physical Therapy	19	0	0.0
PreK Handicapped	59	1	1.7
Gifted	77	31	40.3
Exceptional Other	63	1	1.6
Total Exceptional	1,600	145	9.1

Teachers Currently Teaching in Areas in Which They Are Not Certified

A third indicator of teacher shortage is the number of teachers currently teaching courses in subjects in which they are not certified. As shown in Table 5, the percentage of inappropriately certified teachers in these critical areas includes approximately 22 percent in middle and high school reading, ESOL, and gifted; 18 percent in pre-K handicapped; and 7 to 10 percent in foreign languages, and hearing impaired.

Data on out-of-field status may not be available for several fields where teachers qualify outside the usual certification process. For instance, a number of physical, occupational, and speech therapists are considered in field by virtue of satisfying licensure requirements rather than through state certification. Similarly, in career education fields, such as technology education, districts may hire individuals with expertise in that field, thus bypassing certification based on course requirements.

Table 5
Estimated Number of Full-time Equivalent Teachers
Not Certified in the Appropriate Field
Critical Teacher Shortage Areas
Fall 2008

Subject Field	Number Teachers	Est. Number Teachers Not Approp. Certified	Percentage Not Approp. Certified
Language Arts*	10,344	401	3.9
Math*	11,188	332	3.0
Science*	9,370	503	5.4
Foreign Languages	3,690	362	9.8
Reading *	5,577	1,250	22.4
ESOL	2,826	629	22.3
Indust. Arts/Techology Educ.	597	NA	NA
Intellectual Disabilities	1,702	203	11.9
Specific Learning Disabilities	1,186	89	7.5
Emotionally Handicapped	1,816	121	6.7
Varying Exceptionalities	11,846	421	3.6
Physically Impaired	121	10	8.3
Speech/Language Impaired	2,596	NA	NA
Deaf or Hard of Hearing	414	39	9.4
Visually Impaired	238	9	3.8
Autism Spectrum Disorder	1,068	35	3.3
Occupational/Physical Therapy	488	NA	NA
PreK Handicapped	1,275	228	17.9
Gifted	2,224	492	22.1

*Middle and high school grades.

Critical Teacher Shortage Areas
Financial Assistance Programs

The Florida Department of Education's Office of Student Financial Assistance administers two financial assistance programs designed to increase the number of qualified teachers in designated critical teacher shortage areas: the Critical Teacher Shortage Tuition Reimbursement Program and the Critical Teacher Shortage Student Loan Forgiveness Program.

The Critical Teacher Shortage Tuition Reimbursement Program provides financial support to qualified teachers by assisting them with the repayment of undergraduate and graduate education courses that will lead to certification in a critical teacher shortage subject area. Eligible applicants may receive payments of up to $78 per credit hour, for a maximum 9 hours per award year or $702. The program maximum amount eligible applicants may receive is up to $2,808 for up to 36 semester hours. Awards are prorated based upon the number of eligible applicants and the appropriation provided by the Legislature. The average amount awarded in 2008-09 was $104, which is an award of $14 per credit hour or 18 percent of the maximum award.

As shown by Table 6, the proportion of awards to teachers in total exceptional student education programs under the Tuition Reimbursement Program has dropped from 37 percent in 2004-05 to 27 percent in 2008-09. At the same time, the proportion of awards to teachers seeking certification or endorsement in reading now absorbs 34 percent of the awards.

Table 6
Tuition Reimbursement Awards By Category*

	Number					Percentage				
Shortage Area	2004-05	2005-06	2006-07	2007-08	2008-09	2004-05	2005-06	2006-07	2007-08	2008-09
Math	63	99	125	117	99	11.1%	14.0%	13.3%	13.8%	14.1%
Science	54	60	94	86	71	9.5%	8.5%	10.0%	10.1%	10.1%
Reading	175	239	333	277	236	30.8%	33.7%	35.5%	32.6%	33.7%
Foreign Languages	17	24	31	28	13	3.0%	3.4%	3.3%	3.3%	1.9%
ESOL	16	29	45	46	48	2.8%	4.1%	4.8%	5.4%	6.8%
Total ESE	210	219	255	257	188	36.9%	30.9%	27.2%	30.2%	26.8%
Technology Educ.	17	21	22	19	19	3.0%	3.0%	2.3%	2.2%	2.7%
School Psychologist	17	18	32	20	27	3.0%	2.5%	3.4%	2.4%	3.9%
Other	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%
Total	569	709	937	850	701	100%	100%	100%	100%	100.0%

*Based on statistics compiled by the Office of Student Financial Assistance

The Critical Teacher Shortage Student Loan Forgiveness Program provides financial assistance to eligible Florida teachers by assisting them in the repayment of undergraduate and graduate educational loans that led to certification in a critical teacher shortage subject area. Eligible applicants may receive an annual award of up to $2,500 to repay undergraduate loans and $5,000 for two years to repay graduate loans for support of postsecondary education study. Participants may receive up to a maximum of $10,000 for the duration of the program.

For the 2008-09 award year, full-time teachers who were certified or licensed in,and taught in a critical teacher shortage area at least 180 days during the 2007-08 academic year, and who had educational loans and undergraduate degrees, received a maximum of $443, 18 percent of the maximum award. Those with graduate degrees received a maximum of $886, 18 percent of the maximum award.

Table 7 shows the numbers of Loan Forgiveness awards over the last five years. Most of the awards have gone to exceptional student education teachers, ranging from 71 percent in 2004-05 to 56 percent in 2008-09. The numbers of awards to teachers of math and science have increased to 18 percent and 15 percent of the total, respectively.

Table 7
Loan Forgiveness Awards By Category*

	Number					Percentage				
Shortage Area	2004-05	2005-06	2006-07	2007-08	2008-09	2004-05	2005-06	2006-07	2007-08	2008-09
Math	269	392	561	677	750	11.1%	13.0%	15.3%	16.8%	17.5%
Science	273	366	496	598	660	11.3%	12.1%	13.6%	14.9%	15.4%
Reading	15	34	80	110	134	0.6%	1.1%	2.2%	2.7%	3.1%
Foreign Languages	30	48	69	78	74	1.2%	1.6%	1.9%	1.9%	1.7%
ESOL	54	50	53	56	75	2.2%	1.7%	1.4%	1.4%	1.8%
Total ESE	1,723	2,032	2,258	2,320	2,377	71.3%	67.1%	61.8%	57.7%	55.6%
Technology Educ.	13	17	17	20	23	0.5%	0.6%	0.5%	0.5%	0.5%
School Psychologist	38	88	120	157	183	1.6%	2.9%	3.3%	3.9%	4.3%
Other	0	0	2	4	1	0.0%	0.0%	0.1%	0.1%	0.0%
Total	2,415	3,027	3,656	4,020	4,277	100%	100%	100%	100%	100.0%

Table 8 provides additional information on awards in both programs. Data indicate the following trends:

- Most of the science teachers receiving Loan Forgiveness awards are certified in middle grades science or biology, while fewer are in areas of the physical sciences—earth science, chemistry, or physics. Similarly, most Tuition Reimbursement awards are provided to teachers furthering their education in middle grades science or biology.
- Most Tuition Reimbursement awardees in reading are seeking certification in reading rather seeking a reading endorsement.
- Most of the awards to exceptional student education teachers go to those teaching in the large programs now collapsed into ESE.
- Critical teacher awards are particularly important to speech therapists, many of whom enter the classroom without a master's degree, a requirement for full certification in that field. Most of the awards to speech therapists are for loan forgiveness, as opposed to tuition reimbursement.

Table 8 Critical Teacher Shortage Awards By Certification Area* Reordered by Field										
Critical Teacher Shortage Area	2004-05		2005-06		2006-07		2007-08		2008-09	
	Loan Forgive.	Tuition Reimb.	Loan Forgive.	Tuition Reimb.	Loan Forgive.	Tuition Reimb.	Loan Forgive.	Tuition Reimb.	Loan Forgive.	Tuition Reimb.
Math - Middle Grades	113	23	180	41	248	49	301	48	337	47
Math - 6-12	156	40	212	58	313	76	376	69	413	52
Total Math	**269**	**63**	**392**	**99**	**561**	**125**	**677**	**117**	**750**	**99**
Science - Biology	111	22	155	27	203	41	260	37	314	29
Science - Middle Grades	114	22	147	23	197	37	219	37	220	31
Science - Chemistry	25	6	33	4	46	13	73	9	57	5
Science - Earth Science	9	3	12	4	25	1	32	3	52	5
Science - Physics	14	1	19	2	25	2	24	0	17	1
Total Science	**273**	**54**	**366**	**60**	**496**	**94**	**608**	**86**	**660**	**71**
Reading (Grades K-12)	15	149	34	205	80	290	110	243	134	200
Reading Endorsement	0	26	0	34	0	43	0	34	0	36
Total Reading	**15**	**175**	**34**	**239**	**80**	**333**	**110**	**277**	**134**	**236**
Spanish	20	13	36	20	52	24	63	18	55	8
French	8	3	10	4	13	4	12	2	12	0
Other Languages	2	1	2	0	4	5	2	6	7	5
Total Foreign Lang.	**30**	**17**	**48**	**24**	**69**	**33**	**77**	**26**	**74**	**13**
ESOL	54	15	50	17	53	32	56	26	75	27
ESOL Endorsement	0	1	0	12	0	13	0	20	0	21
Total ESOL	**54**	**16**	**50**	**29**	**53**	**45**	**56**	**46**	**75**	**48**
Middle Gr. Integ. Curr	**0**	**0**	**0**	**0**	**2**	**0**	**4**	**0**	**1**	**0**
Mentally Handicapped	83	1	59	2	90	2	84	2	67	0
Specific Learn. Disabled	165	4	171	2	172	5	109	5	103	2
Emotionally Handicapped	174	1	128	2	150	2	151	4	142	4
Varying Exceptionalities	629	26	803	24	832	22	913	15	614	5
Physically Impaired	2	0	4	1	5	0	8	0	10	0
Exceptional Student Educ.	365	98	543	137	604	156	624	155	1,050	137
Speech - Lang. Impaired	250	41	253	26	298	43	290	33	277	24
Hearing Impaired	18	3	23	1	28	2	32	0	29	0
Visually Impaired	10	1	8	0	12	4	13	1	12	1
Orientation & Mobility	0	0	0	0	0	0	0	1	0	0
Autism Spectrum Disorders	26	0	40	2	67	3	96	9	73	3
Severe or Profound Handi.	0	0	0	0	0	0	0	2	0	1
Pre-K Handicapped	0	0	0	3	0	3	0	6	0	5
Gifted	0	35	0	19	0	13	0	24	0	6
Total ESE	**1,722**	**210**	**2,032**	**219**	**2,258**	**255**	**2,320**	**257**	**2,377**	**188**
Industrial Arts/Tech. Educ	**13**	**17**	**17**	**21**	**17**	**22**	**20**	**19**	**23**	**19**
School Psychologist	**38**	**17**	**88**	**18**	**120**	**32**	**157**	**20**	**183**	**27**
Total Disbursed Count	**2,414**	**569**	**3,027**	**709**	**3,656**	**937**	**4,020**	**850**	**4,277**	**701**

*Based on statistics compiled by the Office of Student Financial Assistance

Teacher Supply – Teacher Education Completers by Sector

For many years statistics on teacher education completers have been based exclusively on a survey completed each year by the education deans and chairpersons of the Florida colleges and universities (public and private) with approved teacher education programs.

The report now also includes information on completers of district alternative certification programs, community college baccalaureate programs in education, and community college and university Educator Preparation Institutes (EPI). EPI programs are alternative certification programs specifically designed for non-education baccalaureate degree holders to enable them to meet educator certification requirements.

Table 9 summarizes the number of teacher education completers in each of these programs. In 2007-08 the traditional teacher education programs supplied 66 percent of the total number of completers, down from 86 percent in 2004-05. EPI programs now account for 16 percent of the total and district programs 18 percent. Altogether, the number of completers has increased from 6,300 in 2004-05 to 9,200 in 2007-08. Projections for 2009-10 total 10,000, with the largest percentage increase in community college baccalaureate and EPI programs.

Table 9
Number of Teacher Education Completers by Sector
All Fields Except Educational Leadership

	Actual				Projected*	
Sector	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
SUS	4,168	4,106	4,507	4,463	4,579	4,666
Privates	1,170	1,313	1,241	1,238	1,113	1,224
CC Bacc	102	178	215	259	269	553
Total	5,440	5,597	5,963	5,960	5,961	6,443
SUS EPI			24	94	196	206
CC EPI		86	715	1,321	1,726	1,726
Total**	0	86	739	1,415	1,922	1,932
District Alt. Cert.	887	1,314	1,508	1,650	1,654	1,660
Total	6,327	6,997	8,210	9,025	9,537	10,035

	Percentages					
Sector	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
SUS	65.9%	58.7%	54.9%	49.5%	48.0%	46.5%
Privates	18.5%	18.8%	15.1%	13.7%	11.7%	12.2%
CC Bacc	1.6%	2.5%	2.6%	2.9%	2.8%	5.5%
Total	86.0%	80.0%	72.6%	66.0%	62.5%	64.2%
SUS EPI			0.3%	1.0%	2.1%	2.1%
CC EPI		1.2%	8.7%	14.6%	18.1%	17.2%
Total	0.0%	1.2%	9.0%	15.7%	20.2%	19.3%
District Alt. Cert.	14.0%	18.8%	18.4%	18.3%	17.3%	16.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

SUS=State Universities CC=Community Colleges
Privates=Private Colleges and Universities
CC Bacc=Community College Baccalaureate Programs
EPI=Educator Preparation Institutes
Alt. Cert - School District Alternative Certification Programs

*The 2008-09 and 2009-10 numbers shown for state universities, private colleges and universities, and community college programs are projections made by the institutions. EPI numbers for 2008-09 are based on final actual reports, while the 2008-09 Alt Cert numbrs are the preliminary actual number. In absence of official projections, the Alt Cert number shown for 2009-10 is a place-holder.

**Note that the totals may be slightly different than reported elsewhere in that (1) this report is based on unduplicated counts and (2) the numbers shown include completers of speech pathology programs, not typically reported by university colleges of education, the source of the numbers of completes in other teacher education programs.

The distribution by sector varies across subject fields. Table 10 shows that traditional teacher education programs produce two-thirds of the completers in exceptional student education and almost three fourths of the completers in reading. On the other hand, two thirds or more of the graduates in the core subjects of English, math, science, and foreign languages enter the classroom via district and EPI programs.

Table 10
Teacher Education Program Completers - 2007-08
Critical Teacher Shortage Areas

	Number by Sector						
Subject Field	SUS	SUS EPI	CC BS	CC EPI*	Priv.	Dist.Alt Cert*	Total
English/Lang. Arts	172	6	0	118	25	237	558
Math	111	18	32	145	16	227	549
Science	70	11	21	121	11	153	387
Reading	205	5	0	51	120	59	440
Foreign Languages	19	2	0	26	0	43	90
ESOL			0	2		12	14
Industrial Arts/Tech. Educ	1	1	0	5		3	10
ESE	372	2	117	123	119	161	894
Speech Impaired	91	0	0	0	1	0	92
Hearing Impaired	7	0	0	0	0	1	8
Visually Impaired	8	0	0	0	0	1	9
Autism	0	0	0	7	0	18	25
PreK Handicapped	26	0	0	7	1	1	35
Gifted	6	0	0	11	0	8	25
Exceptional Other	40	0	0	2	58	0	100
Total Exceptional	550	2	117	150	179	190	1,188
	Percentage Total						
English/Lang. Arts	30.8%	1.1%	0.0%	21.1%	4.5%	42.5%	100.0%
Math	20.2%	3.3%	5.8%	26.4%	2.9%	41.3%	100.0%
Science	18.1%	2.8%	5.4%	31.3%	2.8%	39.5%	100.0%
Reading	46.6%	1.1%	0.0%	11.6%	27.3%	13.4%	100.0%
Foreign Languages	21.1%	2.2%	0.0%	28.9%	0.0%	47.8%	100.0%
ESOL	0.0%	0.0%	0.0%	14.3%	0.0%	85.7%	100.0%
Industrial Arts/Tech. Educ	10.0%	10.0%	0.0%	50.0%	0.0%	30.0%	100.0%
ESE	41.6%	0.2%	13.1%	13.8%	13.3%	18.0%	100.0%
Speech Impaired	98.9%	0.0%	0.0%	0.0%	1.1%	0.0%	100.0%
Hearing Impaired	87.5%	0.0%	0.0%	0.0%	0.0%	12.5%	100.0%
Visually Impaired	88.9%	0.0%	0.0%	0.0%	0.0%	11.1%	100.0%
Autism	0.0%	0.0%	0.0%	28.0%	0.0%	72.0%	100.0%
PreK Handicapped	74.3%	0.0%	0.0%	20.0%	2.9%	2.9%	100.0%
Gifted	24.0%	0.0%	0.0%	44.0%	0.0%	32.0%	100.0%
Exceptional Other	40.0%	0.0%	0.0%	2.0%	58.0%	0.0%	100.0%
Total Exceptional	46.3%	0.2%	9.8%	12.6%	15.1%	16.0%	100.0%

*Distribution by subject field for Alt Cert and EPI based on the completers who were teaching in 2007 or 2008.

Teacher Supply and Projected Shortages for 2010-11

Recent completers are only one source of "new" teachers. Other sources include returning teachers and teachers moving from one district to another. Nevertheless, a comparison of the number of newly-minted teachers and projected vacancies is an important indicator of shortages. Table 11 compares (a) the number of Florida teacher education completers for 2007-08 and the projected number for 2009-10 (Columns 1 and 4), with (b) the number of new hires in fall 2008 (Column 2) and the projected number in 2010-11 (Column 5).

The projected need in 2010-11 includes vacancies due to teacher resignations and retirements, and the additional teachers needed to meet class size targets at the classroom level. Columns 3 and 6 show the numbers of teacher education completers as percentages of the numbers of new hires.

Among the critical shortage fields, Table 11 shows:

- The number of completers in 2007-08 totaled 68 percent of the number of new hires in fall 2008. The projected number of completers in 2009-10 represents 44 percent of the projected need in 2010-11, a drop of 24 percentage points.
- The number of completers as a percentage of teachers needed in total ESE is projected to decrease from 74 percent of the need (column 3) to 54 percent (column 6).
- Other subject fields show a similar decrease, with the gap between supply and demand widest in foreign languages, technology education, and science.

Table 11
Comparison of New Hires and Florida Teacher Education Completers

Subjects	1 Teacher Education Completers 2007-08	2 New Hires Fall 2008	3 Completers as a % of New Hires (1/2)	4 Projected Florida Education Completers 2009-10	5 Projected Number Positions To Be Filled 2010-11	6 Completers as a % of Positions To Be Filled (4/5)
English/Lang. Arts	558	846	66%	615	1,571	39%
Math	549	729	75%	657	1,585	41%
Science	387	771	50%	462	1,399	33%
Reading	440	403	109%	552	670	82%
Foreign Languages	90	273	33%	97	557	17%
ESOL*	14	113	12%	14	283	5%
Industrial Arts/Tech. Educ	10	32	31%	12	41	29%
Exceptional Student Education						
ESE	890	1,053	85%	1,114	1,838	61%
Speech Impaired	92	194	47%	94	237	40%
Hearing Impaired	8	20	40%	9	38	24%
Visually Impaired	9	9	100%	11	12	92%
Autistic	25	111	23%	27	104	26%
Occup./Physical Therapy		19	-	-	22	-
PreK Handicapped	35	59	59%	43	160	27%
Gifted	25	77	32%	27	130	21%
Excep. Other & Dual Program	100	58	-	74	56	132%
Total Exceptional	1,184	1,600	74%	1,399	2,597	54%
Total Above Fields	3,232	4,767	68%	3,808	8,703	44%

*In addition to completers in ESOL programs, a number of other programs include endorsement in ESOL.

CRITICAL TEACHER SHORTAGE AREAS
FOR THE YEARS 1984-85 – 2010-11

1984-85	Math, science, speech therapy, emotionally handicapped, industrial arts, foreign languages
1985-86 1986-87	Math, science, emotionally handicapped, English, foreign languages
1987-88	Math, science, emotionally handicapped, foreign languages
1988-89	Math, science, emotionally handicapped, English, foreign languages
1989-90 1990-91 1991-92	Middle and secondary level science, math, and English; foreign languages; and exceptional student education programs serving the handicapped.
1992-93	Middle and secondary level math and physical sciences; English for speakers of other languages (ESOL); exceptional student education programs
1993-94 1994-95 1995-96	Exceptional student education programs; ESOL
1996-97 1997-98 1998-99 1999-00	Same as 1995-96: (Exceptional student education programs; ESOL), with the addition of technology education/industrial arts
2000-01	Same as 1999-2000: (Exceptional student education programs; ESOL, and technology education/industrial arts), with the addition of middle and secondary mathematics and science
2001-02	Same as 2000-01: (Exceptional student education programs; ESOL, technology education/industrial arts, middle and secondary mathematics and science), with the addition of foreign languages
2002-03	Same as 2001-02: (Exceptional student education programs; ESOL, technology education/industrial arts, middle and secondary mathematics and science, and foreign languages) with the addition of reading and school psychologists
2003-04, 2004-05 2005-06, 2006-07 2007-08	Same as 2002-03: middle and high school level mathematics, middle and high school level science, reading, exceptional student education programs, English for speakers of other languages (ESOL), foreign languages, school psychologists, and technology education/industrial arts.
2008-09	Same as 2007-08: middle and high school level mathematics, middle and high school level science, reading, exceptional student education programs, English for speakers of other languages (ESOL), foreign languages, and technology education/industrial arts, with the addition of middle and high school level English/language arts, and the deletion of school psychologists.
2009-10 2010-11	Same as 2008-09: middle and high school level mathematics, middle and high school level science, middle and high school level English/language arts, reading, exceptional student education programs, English for speakers of other languages (ESOL), foreign languages, and technology education/industrial arts.

D-3: 2008-09 LEARNING GAINS IN READING AND MATH

2008-09 Teacher Performance Based on Percentages of Students Making Learning Gains in Reading and Mathematics										
	Teachers	Number of Teachers with MORE THAN 50% of Students Making Learning Gains	Percent of Teachers with MORE THAN 50% of Students Making Learning Gains	Number of Teachers with 75% OR MORE of Students Making Learning Gains	Percent of Teachers with 75% OR MORE of Students Making Learning Gains	Number of Teachers with 80% OR MORE of Students Making Learning Gains	Percent of Teachers with 80% OR MORE of Students Making Learning Gains	Number of Teachers with 90% OR MORE of Students Making Learning Gains	Percent of Teachers with 90% OR MORE of Students Making Learning Gains	
Elem Reading	**18712**	**17000**	**91**	**7806**	**42**	**5127**	**27**	**1266**	**7**	
Elem ESE Rdg	**1666**	**1042**	**63**	**305**	**18**	**209**	**13**	**58**	**3**	
Elem Math	**16766**	**13824**	**82**	**5988**	**36**	**4056**	**24**	**1187**	**7**	
Elem ESE Math	**1131**	**634**	**56**	**183**	**16**	**128**	**11**	**44**	**4**	
Middle Reading	**10996**	**10149**	**92**	**2755**	**25**	**1287**	**12**	**192**	**2**	
Middle ESE Reading	**1730**	**1244**	**72**	**271**	**16**	**159**	**9**	**30**	**2**	
Middle Math	**7245**	**6088**	**84**	**3510**	**48**	**2475**	**34**	**519**	**7**	
Middle ESE Math	**1154**	**721**	**62**	**199**	**17**	**124**	**11**	**43**	**4**	
High Reading	**8419**	**3189**	**38**	**394**	**5**	**195**	**2**	**19**	**0**	
High ESE Reading	**820**	**92**	**11**	**7**	**1**	**6**	**1**	**1**	**0**	
High Math	**6199**	**5736**	**93**	**3144**	**51**	**2075**	**33**	**361**	**6**	
High ESE Math	**632**	**347**	**55**	**61**	**10**	**41**	**6**	**9**	**1**	
Reading	**38127**	**30338**	**80**	**10955**	**29**	**6609**	**17**	**1477**	**4**	
Reading ESE	**4216**	**2378**	**56**	**583**	**14**	**374**	**9**	**89**	**2**	
Math	**30210**	**25648**	**85**	**12642**	**42**	**8606**	**28**	**2067**	**7**	
Math ESE	**2917**	**1702**	**58**	**443**	**15**	**293**	**10**	**96**	**3**	

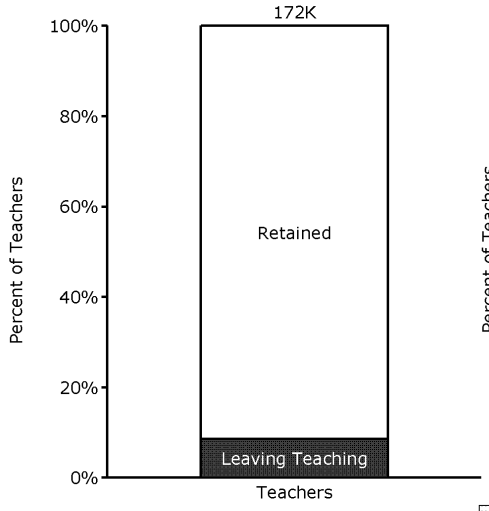
D-3: 2008-09 LEARNING GAINS IN READING AND MATH

Teacher Performance in Reading and Mathematics Based on Learing Gains Percentages by School Type				
School Type	Percent of Reading Teachers with 60% OR MORE of Students Making Learning Gains	Percent of Reading Teachers with 80% OR MORE of Students Making Learning Gains	Percent of Math Teachers with 60% OR MORE of Students Making Learning Gains	Percent of Math Teachers with 80% OR MORE of Students Making Learning Gains
Low Poverty Schools	75%	28%	85%	41%
High Poverty Schools	64%	15%	64%	21%
Low Minority Schools	72%	21%	77%	32%
High Minority Schools	57%	14%	68%	23%
Both High Minority and High Poverty Schools	63%	15%	65%	22%
Both Low Minority and Low Poverty Schools	78%	29%	85%	40%

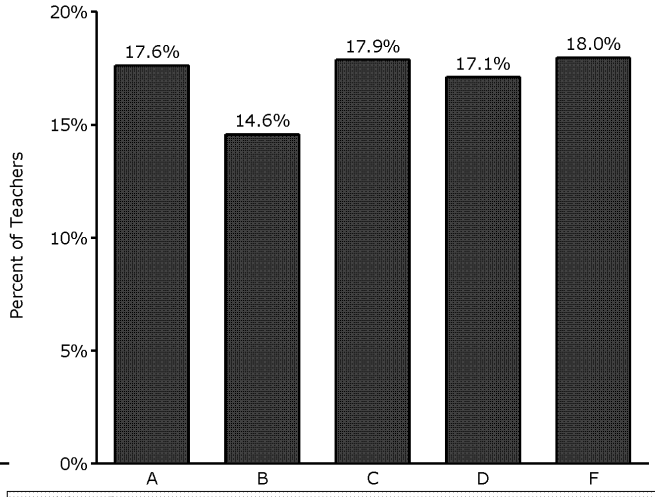
D-4 - RATE OF TEACHERS EXITING THE SYSTEM

Nearly 10% of the Florida Teaching Population Leaves Annually, Worst Performing Teachers Do Not Exit at a Higher Rate

Classroom Teachers Leaving Teaching, 2007-2008



Percent of Teachers Leaving Scoring One St. Dev Below Average, 2007-2008



	A	B	C	D	F
Total % 1 St. Dev. Below	14.7%	14.0%	17.1%	16.6%	16.7%
Percent Leaving	8.0%	8.4%	8.0%	9.0%	9.7%

Note: School grade is previous year's school grade
Source: Florida DOE

D-5a - Data on student performance of completers of Florida's teacher preparation programs (ranked)

Initial Teacher Preparation Programs (ITPs)	Average Value Table Score (100 is average)	Total Number of Teachers Identified	Percent of Teacher with a Value Table Score of 125 or Higher
Florida Southern College	**100.3**	10	**30.0%**
FIU	**99.5**	81	**25.9%**
Florida Memorial University	97.2	15	13.3%
University of Miami	96.6	19	15.8%
FGCU	95.4	78	**20.5%**
FSU	95.0	99	**20.2%**
UF	94.6	89	18.0%
UNF	94.5	94	**22.3%**
FAU	93.5	**194**	**20.1%**
UCF	92.0	**239**	17.6%
Nova Southeastern University	91.9	**229**	18.3%
Saint Leo University	91.7	86	17.4%
Barry University	91.6	65	**20.0%**
Stetson University	90.3	37	18.9%
USF	88.4	342	13.2%
Southeastern University	87.4	15	0.0%
St. Petersburg College	87.2	57	15.8%
University of Tampa	86.9	15	0.0%
FAMU	80.8	25	12.0%
UWF	77.5	78	12.8%
Miami-Dade College	76.4	25	12.0%
Flagler College	70.2	39	15.4%
Bethune Cookman University	*	6	*
Chipola College	*	9	*
Florida Institute of Technology	*	1	*
Jacksonville University	*	2	*
Lynn University	*	3	*
Palm Beach Atlantic University	*	5	*
Rollins College	*	2	*
Warner Southern University	*	4	*
ITP Results	**90.7**	**1,963**	**17% (=339)**
Based on FCAT scores between 2008 and 2009 for teachers teaching Reading/Language Arts and Math in Grades 4-10			
*Fewer than 10 teachers with sufficient data to calculate a value table score			

D-5a - Data on student performance of completers of Florida's teacher preparation programs (ranked)

Educator Preparation Institutes (EPIs)	Average Value Table Score (100 is average)	Total Number of Teachers Identified	Percent of Teacher with a Value Table Score of 125 or Higher
Brevard Community College	**120.3**	18	**38.9%**
Miami-Dade College	**103.4**	17	**23.5%**
Manatee Community College	**101.6**	16	**31.3%**
Lake-Sumter Community College	**101.2**	14	**21.4%**
Valencia Community College	98.0	17	17.6%
Florida Comm. Coll. at Jacksonville	97.5	**29**	**24.1%**
Broward Community College	95.9	14	**21.4%**
Central Florida Community College	93.6	14	7.1%
Edison College	93.1	19	**21.1%**
Indian River Community College	92.9	**27**	11.1%
Polk Community College	89.5	**39**	17.9%
Okaloosa-Walton College	88.7	14	**21.4%**
Pasco Hernando Community College	88.5	19	15.8%
Palm Beach Community College	86.8	13	7.7%
St. Petersburg College	83.5	23	17.4%
Daytona Beach Community College	71.8	24	4.2%
Gulf Coast Community College	*	9	*
Hillsborough Community College	*	4	*
Lake City Community College	*	3	*
North Florida Community College	*	6	*
Pensacola Junior College	*	9	*
Santa Fe Community College	*	7	*
Seminole Community College	*	3	*
St. Johns River Community College	*	4	*
Tallahassee Community College	*	4	*
UF	*	9	*
UWF	*	5	*
EPI Results	**92.2**	**380**	**18% (=70)**

Based on FCAT scores between 2008 and 2009 for teachers teaching Reading/Language Arts and Math in Grades 4-10

*Fewer than 10 teachers with sufficient data to calculate a value table score

D-5a - Data on student performance of completers of Florida's teacher preparation programs (ranked)

District Alternative Certification Programs	Average Value Table Score (100 is average)	Total Number of Teachers Identified	Percent of Teacher with a Value Table Score of 125 or Higher
Seminole	**108.0**	11	18.2%
Manatee	**103.1**	14	**21.4%**
Dade	97.2	**85**	12.9%
Duval	95.2	51	15.7%
Hillsborough	93.4	**134**	18.7%
Orange	92.3	**104**	11.5%
Pasco	91.0	52	**21.2%**
Lee	90.8	16	12.5%
Palm Beach	90.1	18	11.1%
Bay	88.1	15	13.3%
Escambia	80.7	36	16.7%
Pinellas	76.9	37	13.5%
Polk	69.3	38	5.3%
Wakulla	*	1	*
Volusia	*	9	*
UF Lab School	*	1	*
Sumter	*	3	*
St. Lucie	*	6	*
St. Johns	*	1	*
Sarasota	*	3	*
Santa Rosa	*	8	*
Putnam	*	1	*
Osceola	*	1	*
Okeechobee	*	1	*
Okaloosa	*	6	*
Monroe	*	1	*
Marion	*	2	*
Liberty	*	4	*
Lake	*	4	*
Indian River	*	1	*
Highlands	*	7	*
Hernando	*	3	*
Hendry	*	5	*
Hardee	*	9	*
FSU Lab School	*	2	*
Dixie	*	1	*
DeSoto	*	6	*
Collier	*	4	*
Clay	*	4	*
Citrus	*	2	*
Broward	*	7	*
Brevard	*	7	*
Bradford	*	2	*
DACP Results	**90.9**	**723**	**16% (=114)**
Based on FCAT scores between 2008 and 2009 for teachers teaching Reading/Language Arts and Math in Grades 4-10			
*Fewer than 10 teachers with sufficient data to calculate a value table score			

D-5b - Data on student performance of completers of Florida's teacher preparation programs

	Percent of teachers that had 50% or more of their students making learning gains			Percent of teachers that had 75% or more of their students making learning gains			Percent of "High Performing" teachers (based on a Value Table Score of 125, where 100 is average)			Average Value Table Score (100 is average)		
Institution	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)
State University System												
FAMU	64%	N/A	N/A	20%	N/A	N/A	12%	N/A	N/A	80.8	N/A	N/A
FAU	**84%**	N/A	N/A	**34%**	N/A	N/A	**20%**	N/A	N/A	93.5	N/A	N/A
FGCU	**91%**	N/A	N/A	**33%**	N/A	N/A	**21%**	N/A	N/A	95.4	N/A	N/A
FIU	**81%**	N/A	N/A	**38%**	N/A	N/A	**26%**	N/A	N/A	99.5	N/A	N/A
FSU	**85%**	N/A	N/A	**33%**	N/A	N/A	**20%**	N/A	N/A	95.0	N/A	N/A
UCF	**82%**	N/A	N/A	25%	N/A	N/A	18%	N/A	N/A	92.0	N/A	N/A
UF	**82%**	*	N/A	27%	*	N/A	18%	*	N/A	94.6	*	N/A
UNF	**80%**	N/A	N/A	**41%**	N/A	N/A	**22%**	N/A	N/A	94.5	N/A	N/A
USF	**82%**	N/A	N/A	25%	N/A	N/A	13%	N/A	N/A	88.4	N/A	N/A
UWF	69%	*	N/A	19%	*	N/A	13%	*	N/A	77.5	*	N/A
Florida College System												
Brevard Community College	N/A	**89%**	N/A	N/A	**50%**	N/A	N/A	**39%**	N/A	N/A	**120.3**	N/A
Broward Community College	N/A	**86%**	N/A	N/A	21%	N/A	N/A	**21%**	N/A	N/A	95.9	N/A
Central Florida Community College	N/A	**93%**	N/A	N/A	14%	N/A	N/A	7%	N/A	N/A	93.6	N/A
Chipola College	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A
Daytona Beach Community College	N/A	63%	N/A	N/A	8%	N/A	N/A	4%	N/A	N/A	71.8	N/A
Edison College	N/A	74%	N/A	N/A	16%	N/A	N/A	**21%**	N/A	N/A	93.1	N/A
Florida Comm. College at Jacksonville	N/A	**79%**	N/A	N/A	31%	N/A	N/A	**24%**	N/A	N/A	97.5	N/A
Gulf Coast Community College	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A
Hillsborough Community College	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A
Indian River Community College	N/A	**78%**	N/A	N/A	**33%**	N/A	N/A	11%	N/A	N/A	92.9	N/A
Lake City Community College	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A
Lake-Sumter Community College	N/A	**86%**	N/A	N/A	**43%**	N/A	N/A	**21%**	N/A	N/A	**101.2**	N/A

D-5b - Data on student performance of completers of Florida's teacher preparation programs

	Percent of teachers that had 50% or more of their students making learning gains			Percent of teachers that had 75% or more of their students making learning gains			Percent of "High Performing" teachers (based on a Value Table Score of 125, where 100 is average)			Average Value Table Score (100 is average)		
Institution	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)
Manatee Community College	N/A	**81%**	N/A	N/A	**38%**	N/A	N/A	**31%**	N/A	N/A	**101.6**	N/A
Miami-Dade College	56%	**76%**	N/A	28%	**35%**	N/A	12%	**24%**	N/A	76.4	**103.4**	N/A
North Florida Community College	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A
Okaloosa-Walton College	N/A	64%	N/A	N/A	7%	N/A	N/A	**21%**	N/A	N/A	88.7	N/A
Palm Beach Community College	N/A	69%	N/A	N/A	**31%**	N/A	N/A	8%	N/A	N/A	86.8	N/A
Pasco Hernando Community College	N/A	**79%**	N/A	N/A	16%	N/A	N/A	16%	N/A	N/A	88.5	N/A
Pensacola Junior College	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A
Polk Community College	N/A	72%	N/A	N/A	10%	N/A	N/A	18%	N/A	N/A	89.5	N/A
Santa Fe Community College	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A
Seminole Community College	N/A	*	N/A	N/A	*	N/A		*	N/A	N/A	*	N/A
St. Johns River Community College	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A
St. Petersburg College	88%	**78%**	N/A	**33%**	**35%**	N/A	16%	17%	N/A	87.2	83.5	N/A
Tallahassee Community College	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A
Valencia Community College	N/A	**100%**	N/A	N/A	**41%**	N/A	N/A	*	N/A	N/A	98.0	N/A
Independent Colleges and Universities of Florida												
Barry University	**83%**	N/A	N/A	29%	N/A	N/A	**20%**	N/A	N/A	91.6	N/A	N/A
Bethune Cookman University	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A
Flagler College	69%	N/A	N/A	21%	N/A	N/A	15%	N/A	N/A	70.2	N/A	N/A
Florida College	*	N/A	N/A	N/A	N/A	N/A	*	N/A	N/A	*	N/A	N/A
Florida Institute of Technology	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A
Florida Memorial University	**87%**	N/A	N/A	20%	N/A	N/A	13%	N/A	N/A	97.2	N/A	N/A
Florida Southern College	**90%**	N/A	N/A	**30%**	N/A	N/A	30%	N/A	N/A	**100.3**	N/A	N/A
Jacksonville University	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A

D-5b - Data on student performance of completers of Florida's teacher preparation programs

	Percent of teachers that had 50% or more of their students making learning gains			Percent of teachers that had 75% or more of their students making learning gains			Percent of "High Performing" teachers (based on a Value Table Score of 125, where 100 is average)			Average Value Table Score (100 is average)		
Institution	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)
Lynn University	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A
Nova Southeastern University	**83%**	N/A	N/A	28%	N/A	N/A	18%	N/A	N/A	91.9	N/A	N/A
Palm Beach Atlantic University	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A
Rollins College	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A
Saint Leo University	**80%**	N/A	N/A	**35%**	N/A	N/A	17%	N/A	N/A	91.7	N/A	N/A
Southeastern University	**87%**	N/A	N/A	13%	N/A	N/A	0%	N/A	N/A	87.4	N/A	N/A
Stetson University	**84%**	N/A	N/A	24%	N/A	N/A	19%	N/A	N/A	90.3	N/A	N/A
University of Miami	**79%**	N/A	N/A	26%	N/A	N/A	16%	N/A	N/A	96.6	N/A	N/A
University of Tampa	**80%**	N/A	N/A	7%	N/A	N/A	0%	N/A	N/A	86.9	N/A	N/A
Warner Southern University	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A
Learning Gains based on FCAT Reading and FCAT Math performance gains in Grades 4 through 10												
*Fewer than 10 teachers with sufficient data to calculate learning gains												
N/A - No teachers matched												
School Districts												
Bay	N/A	N/A	73%	N/A	N/A	20%	N/A	N/A	13%	N/A	N/A	88.1
Bradford	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Brevard	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Broward	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Citrus	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Clay	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Collier	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Dade	N/A	N/A	**84%**	N/A	N/A	**31%**	N/A	N/A	13%	N/A	N/A	97.2
DeSoto	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Dixie	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Duval	N/A	N/A	71%	N/A	N/A	22%	N/A	N/A	16%	N/A	N/A	95.2
Escambia	N/A	N/A	75%	N/A	N/A	11%	N/A	N/A	17%	N/A	N/A	80.7
Hardee	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Hendry	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Hernando	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Highlands	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*

D-5b - Data on student performance of completers of Florida's teacher preparation programs

	Percent of teachers that had 50% or more of their students making learning gains			Percent of teachers that had 75% or more of their students making learning gains			Percent of "High Performing" teachers (based on a Value Table Score of 125, where 100 is average)			Average Value Table Score (100 is average)		
Institution	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)	Initial Teacher Preparation Programs (ITP)	Educator Preparation Insititutes (EPI)	District Alternative Certification (DAC)
Hillsborough	N/A	N/A	**81%**	N/A	N/A	24%	N/A	N/A	19%	N/A	N/A	93.4
Indian River	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Lake	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Lee	N/A	N/A	63%	N/A	N/A	6%	N/A	N/A	13%	N/A	N/A	90.8
Liberty	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Manatee	N/A	N/A	71%	N/A	N/A	21%	N/A	N/A	**21%**	N/A	N/A	**103.1**
Marion	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Monroe	N/A	N/A	**100%**	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Okaloosa	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Okeechobee	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Orange	N/A	N/A	**81%**	N/A	N/A	18%	N/A	N/A	12%	N/A	N/A	92.3
Osceola	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Palm Beach	N/A	N/A	**89%**	N/A	N/A	28%	N/A	N/A	11%	N/A	N/A	90.1
Pasco	N/A	N/A	**83%**	N/A	N/A	27%	N/A	N/A	**21%**	N/A	N/A	91.0
Pinellas	N/A	N/A	51%	N/A	N/A	22%	N/A	N/A	14%	N/A	N/A	76.9
Polk	N/A	N/A	66%	N/A	N/A	3%	N/A	N/A	5%	N/A	N/A	69.3
Putnam	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Santa Rosa	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Sarasota	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Seminole	N/A	N/A	**91%**	N/A	N/A	18%	N/A	N/A	18%	N/A	N/A	**108.0**
St. Johns	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
St. Lucie	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Seminole	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Sumter	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Volusia	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Wakulla	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
FSU Lab School	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*	N/A	N/A	*
Learning Gains based on FCAT Reading and FCAT Math performance gains in Grades 4 through 10												
*Fewer than 10 teachers with sufficient data to calculate learning gains												
N/A - No teachers matched												

D-6: Section (D) Initiative Summary Chart

Federal Requirement	Initiative Outcome	Implementation Timeline	Total Budget
(D)(2)(i) measure student growth	Improve ability and breadth in measurement of student academic growth at the district and state levels	Year 1: Select new statewide measure for student growth in FCAT-associated courses that is attributable at the teacher level; provide districts with baseline data for these students and teachers; issue grants to professional associations to develop measures for performance-based courses.	$5,800,000
		Year 2: Provide districts with growth models for use with standardized assessments and existing district-developed assessments; provide districts with FCAT performance data using new growth measure.	
		Year 3: Districts create assessments from items used in state interim assessments; districts implement measures in performance-based classes.	
		Year 4: Groups of districts create and share assessments for other core courses through community of practice; district-developed assessments for core and high-incidence courses are shared among participants; state adopts recommendations for performance measures in performance-based courses	
(D)(2)(ii) design evaluation systems	Implement rigorous, transparent, and fair evaluation systems for teachers and principals that measure student growth	Year 1: Districts revise teacher and principal evaluations based on core practices and baseline teacher effectiveness data; state provides national expertise and support.	$14,980,000
		Year 2: Districts implement new teacher and principal evaluations to incorporate statewide student growth measure; districts pilot additional teacher-level student growth measures. In years two through four, experts will continue supporting their districts with monitoring and feedback in the implementation of their evaluation systems.	
		Year 3: Districts implement new evaluations to incorporate statewide and Year 2 piloted student growth measures; districts pilot additional teacher-level student growth measures.	
		Year 4: districts implement new evaluations for all teachers that incorporate statewide and comparable local student growth measures to cover at least 80% of teachers and 100% of principals	
(D)(2)(iii) Conduct Annual Evaluations	Revise district evaluation systems to give additional support and information to 1st- and 2nd- year teachers and teachers in the year before a milestone career event	Year 1 : Districts revise teacher and principal evaluations based on core practices and baseline teacher effectiveness data; state provides national expertise, and support; Districts revise teacher evaluations based on core practices and baseline teacher effectiveness data; districts develop a beginning teacher support program	included in (D)(2)(ii) budget
		Year 2: Districts implement new teacher and principal evaluations to incorporate statewide student growth measure; districts pilot additional teacher-level student growth measures; state-provided evaluation experts continue support with implementation.	

Federal Requirement	Initiative Outcome	Implementation Timeline	Total Budget
		Year 3: Districts pilot additional metrics for evaluations of milestone teachers; districts incorporate data from formative and interim assessments into beginning teacher evaluations; districts implement new evaluations to incorporate statewide and Year 2 piloted student growth measures; districts pilot additional teacher-level student growth measures; state-provided evaluation experts continue support with implementation	
		Year 4: Districts conduct evaluations for 1st and 2nd year teachers that are integrated with the district's beginning teacher program; state-provided evaluation experts continue support with implementation; districts conduct completed multi-metric evaluations of milestone teachers and use the results in making the milestone career decisions; districts implement new evaluations for all teachers that incorporate statewide and comparable local student growth measures to cover at least 80% of teachers and 100% of principals	
(D)(2)(iv) use evaluations to inform compensation, promotion, retention, tenure, removal	Incorporating evaluation results into making career decisions	Year 1: N/A - district evaluations are in re-development, so other decisions based on evaluations are not yet being made	$45,550,000
		Year 2: Some districts will use evaluation results to inform retention decisions (retention = annual contract); state provides consultant to identify existing fiscal resources to make the transition to performance-based compensation	
		Year 3: All districts will use evaluation results for retention purposes; some districts will use evaluation results to inform retention, some compensation, and some promotion decisions (tenure = professional service contract); financial consultants provide assistance	
		Year 4: Participating districts will use evaluation results to inform removal, compensation, and tenure decisions; financial consultants provide assistance	
(D)(3)(i) Ensure equitable distribution of effective teachers and principals in high poverty/ minority schools	Improving districts' ability and accountability for assigning effective teachers and principals to high need schools	Year 1: All participating districts examine current policies, practices and baseline student growth data and begin negotiations to change policies (some will complete); job-embedded teacher preparation programs developed; principal preparation programs developed; institute recruitment efforts for effective minority teachers	$25,642,000
		Year 2: All participating districts implement new evaluation systems and complete negotiations of new policies; FDOE begins reporting data by school on evaluation results and student growth; job-embedded teacher and principal preparation programs implemented; continue minority teacher recruitment program; develop enhancement to recruitment center for addition of effectivness measures	
		Year 3: All districts will implement board policies to use evaluation results for determining assignment of teachers; teachers hired from job-embedded teacher preparation programs in some districts; first cohort of principals complete preparation programs; continue minority teacher recruitment program; implement enhancement to recruitment center for addition of effectivness measures	
		Year 4: Schools in participating districts reflect the appropriate balance of effective and highly effective staff in high poverty/ minority schools continue minority teacher recruitment program	

Federal Requirement	Initiative Outcome	Implementation Timeline	Total Budget
(D)(3)(ii) Ensure equitable distribution of effective teachers and principals in hard to staff subjects/ specialties	Improving districts' access to teachers in hard to staff subjects and their accountability for assigning those teachers equitably to high poverty/minority schools and	Year 1: All participating districts examine current policies, practices and baseline student growth data and begin negotiations to change policies (some will complete) for assignment of teachers and programs to support high performers in hard to staff placements; STEM teacher preparation programs and fast track leadership programs developed	$7,700,000
		Year 2: All participating districts implement new evaluation systems and begin to implement new strategies; partner institutions admit first STEM program teacher candidates.	
		Year 3: Districts revise strategies and institute science assessments as part of evaluations.	
		Year 4: Schools in participating districts reflect the appropriate balance of effective and highly effective staff in reading, mathematics and ESOL and begin implementing strategies for science; first completers of STEM teacher education programs employed in districts.	
(D)(4) evaluate teacher and principal preparation programs	Using performance measures to improve contributions of teacher and principal preparation programs	Year 1: Teacher preparation programs in STEM developed; job-embedded programs developed; principal program developed; baseline student growth data provided to existing programs.	$2,600,000
		Year 2: Partner institutions admit first new program teacher candidates; new performance measure categories for continued program approval established.	
		Year 3: Districts hire first job-embedded teacher prep program candidates; first principals completed; preliminary ratings of teacher preparation programs published	
		Year 4: First completers of STEM teacher education programs and principals employed in districts; first candidates in job-embedded programs completed; data from partner programs used to revise initial program approval requirements and establish measures for continued approval requirements	
(D)(5)(i) provide effective support to teachers and principals and (ii) evaluate effectiveness of Professional Development	Improve districts' ability to provide effective professional development to teachers and principals	Year 1: Commissioner's Leadership Academy developed; provide districts with training on methods of evaluating professional development and lesson study; develop school board training; districts develop components of beginning teacher support programs	$18,606,760
		Year 2: Assist districts with implementing evaluation of professional development provided on common core standards and lesson study; develop state standards for instructional coaches; post digital resources for follow-up and continued training on common core and lesson study; districts incorporate teacher evaluation results into professional development systems; begin delivery of school board training; enroll foist cohort in Commissioner's Academy; districts begin implementing beginning teacher support programs	
		Year 3: Provide districts with training and trainer materials on instructional coaching standards; continue follow-up support on evaluation of professional development; implement statewide reporting of professional development evaluation results; evaluate Leadership Academy	

Federal Requirement	Initiative Outcome	Implementation Timeline	Total Budget
		Year 4: Adopt instructional coaching standards statewide; disseminate successful practices in professional development based on evaluation results through state's online portal; Leadership Academy self-supporting	
Community of Practice (supports entire Assurnace)	Support for participating districts to share successful practices and products, as well as implementation challenges and solutions.	The FDOE will facilitate semi-annual Community of Practice meetings for participating districts to share successful practices and products, as well as implementation challenges and solutions.	$489,760
GTL Evaluation (Supports entire Assurance)	GTL evaluation will provide outcomes and effects of initiatives on student achievement and on the teacher and principal workforce	Year 1: Set up evaluation questions, framework; work with districts to ensure data collections in place.	$2,000,000
		Year 2: Implement evaluation; annual report of results.	
		Year 3: Implement evaluation; annual report of results.	
		Year 4: Implement evaluation; final report will occur within 6 months of end of grant.	
Totals			**$123,368,520**

E-1 - Data on Historic Turnaround Record

Years	D to A	%	D to B	%	D to C	%	Total # of D Schools	% D's that moved up one letter grade or more out of total # of D schools only
04-05	4	2.2%	11	6%	70	38%	184	46%
05-06	14	4.5%	30	9.7%	99	32%	230	62%
06-07	6	4.2%	4	2.8%	23	16%	122	27%
07-08	7	2.3%	23	7.7%	93	31%	216	57%

Years	F to A	%	F to B	%	F to C	%	F to D	%	Total # of F Schools	% F's that moved up one letter grade or more out of total # of F schools only
04-05	0	0%	2	4%	5	10%	22	45%	49	59%
05-06	2	.65%	0	0%	12	4%	11	3.6%	78	32%
06-07	0	0%	1	.7%	2	1.4%	7	4.9%	21	48%
07-08	5	1.7%	7	2.3%	33	11%	20	6.7%	83	78%

Years	Total # of D& F Schools	% combined that moved up one letter grade or more out of total # of D & F schools
04-05	233	49%
05-06	308	54%
06-07	143	30%
07-08	299	63%

E-2 - 2009-10 DIFFERENTIATED ACCOUNTABILITY SCHOOL CATEGORIES

CATEGORY I	CATEGORY II
PREVENT I • "A", "B", "C", or ungraded schools that have missed AYP for at least two consecutive years, with AYP Counts from 1 to 3, and have met at least 80% of AYP criteria for at least two consecutive years. ********** ⌖ *SCHOOL IMPLEMENTS INTERVENTIONS* ⌖ *DISTRICT MONITORS PROGRESS AND SUPPORTS SCHOOLS*	**PREVENT II** • "D" schools that have missed AYP for fewer than two consecutive years. • "D" schools that have missed AYP for at least two consecutive years, with AYP Counts from 1 to 3. • "A", "B","C", or ungraded schools that have missed AYP for at least two consecutive years, with AYP Counts from 1 to 3, and have met less than 80% of AYP criteria for at least two consecutive years. ********** ⌖ *SCHOOL IMPLEMENTS INTERVENTIONS* ⌖ *DISTRICT DIRECTS SCHOOL INTERVENTIONS* ⌖ *DISTRICT MONITORS PROGRESS AND SUPPORTS SCHOOLS* ⌖ *STATE MONITORS DISTRICT'S SUPPORT OF SCHOOLS*
CORRECT I • "A", "B", "C", or ungraded schools with AYP Counts of 4 or greater that have met at least 80% of AYP criteria. ********** ⌖ *SCHOOL IMPLEMENTS INTERVENTIONS* ⌖ *DISTRICT DIRECTS INTERVENTIONS* ⌖ *DISTRICT MONITORS PROGRESS AND SUPPORTS SCHOOLS*	**CORRECT II** • All "F" schools regardless of AYP status. • "D" schools with AYP Counts of 4 or greater. • "A", "B", "C", or ungraded schools with AYP Counts of 4 or greater that have met less than 80% of AYP criteria. ********** ⌖ *SCHOOL IMPLEMENTS INTERVENTIONS* ⌖ *DISTRICT DIRECTS SCHOOL INTERVENTIONS* ⌖ *DISTRICT AND STATE MONITOR PROGRESS AND SUPPORT SCHOOLS* ⌖ *DISTRICT AND STATE PROVIDE INTENSIVE ONSITE SUPPORT*
SCHOOLS NOT REQUIRED TO PARTICIPATE IN DA STRATEGIES • "A", "B", "C", and ungraded schools that have not missed AYP for two consecutive years.	**INTERVENE** • Current "F" schools that have earned at least four "F" grades in the last six school years. • "D" Correct II or "F" schools that meet three of the following: ○ Percentage non-proficient students in reading increased compared to percentage attained five years earlier. ○ Percentage non-proficient students in math increased compared to the percentage attained five years earlier. ○ 65 % or more of students not proficient in reading. ○ 65 % or more of students not proficient in math. ********** ⌖ *SCHOOL IMPLEMENTS INTERVENTIONS* ⌖ *DISTRICT AND STATE MONITOR ONSITE* ⌖ *DISTRICT AND STATE PROVIDE INTENSIVE ONSITE SUPPORT* ⌖ *DISTRICT CHOOSES ONE OF FOUR OPTIONS TO TURNAROUND THE STRUGGLING SCHOOL* 1. *Convert school to a district turnaround school* 2. *Reassign students and monitor progress* 3. *Close and reopen as a charter school* 4. *Contract with an outside with a record of effectiveness to run the school*

- For purposes of Differentiated Accountability (DA), high schools' grade will be established solely by the FCAT scores and AYP.
- An "A", "B", "C", or ungraded school enters DA after missing Adequate Yearly Progress (AYP) for two consecutive years starting from 2002-2003. An "AYP Count" value is assigned to all schools. The AYP Count starts at 1 for a school that has missed AYP for two consecutive years. The count increases for each year that a school in DA misses AYP. A school must make AYP two consecutive years to exit DA. If a school in DA then makes AYP one year, the school's AYP Count freezes. However, if that school then misses AYP in the following year, the school's AYP Count resumes. Reaching AYP for two consecutive years resets the AYP Count at zero. To re-enter DA, a school would need to miss AYP for two consecutive years or be graded D or F.
- To exit the Intervene category a school must make significant progress after one year. Significant progress is defined as: 1. The school's letter grade improves to a "C" or better, and 2. The school's AYP performance improves so that at least one subgroup in reading and at least one subgroup in mathematics that previously did not make AYP has made AYP.

E-3 - LOWEST 5% OF TITLE I-ELIGIBLE SCHOOLS (19)

District Name	School Name	DA 2008	DA 2009
ALACHUA	HAWTHORNE MIDDLE/HIGH SCHOOL	NA	CORRECT II
COLUMBIA	COLUMBIA HIGH SCHOOL	PREVENT II	CORRECT II
HAMILTON	HAMILTON COUNTY HIGH SCHOOL	PREVENT II	CORRECT II
HARDEE	HARDEE SENIOR HIGH SCHOOL	PREVENT II	CORRECT II
HENDRY	CLEWISTON HIGH SCHOOL	NA	CORRECT II
HERNANDO	HERNANDO HIGH SCHOOL	PREVENT II	CORRECT II
HERNANDO	CENTRAL HIGH SCHOOL	PREVENT II	CORRECT II
LAKE	LEESBURG HIGH SCHOOL	PREVENT II	CORRECT II
LEVY	WILLISTON HIGH SCHOOL	NA	CORRECT II
ORANGE	EVANS HIGH SCHOOL	PREVENT II	CORRECT II
ORANGE	OAK RIDGE HIGH SCHOOL	PREVENT II	CORRECT II
OSCEOLA	GATEWAY HIGH SCHOOL	PREVENT II	CORRECT II
OSCEOLA	CELEBRATION HIGH SCHOOL	PREVENT II	CORRECT II
OSCEOLA	POINCIANA HIGH SCHOOL	PREVENT II	CORRECT II
PASCO	RIDGEWOOD HIGH SCHOOL	PREVENT II	CORRECT II
PINELLAS	BOCA CIEGA HIGH SCHOOL	PREVENT II	CORRECT II
PINELLAS	DIXIE M. HOLLINS HIGH SCHOOL	PREVENT II	CORRECT II
PINELLAS	LAKEWOOD HIGH SCHOOL	PREVENT II	CORRECT II
PINELLAS	GIBBS HIGH SCHOOL	PREVENT II	CORRECT II

As of 12/02/2009

E-4 - LOWEST 5% OF TITLE I SCHOOLS

District Name	School Name	DA 2008	DA 2009
ALACHUA	CHARLES W. DUVAL ELEMENTARY SCHOOL	PREVENT I	CORRECT II
ALACHUA	MARJORIE KINNAN RAWLINGS ELEMENTARY SCHOOL	CORRECT I	CORRECT II
BROWARD	COCONUT CREEK HIGH SCHOOL*	CORRECT II	CORRECT II
BROWARD	LARKDALE ELEMENTARY SCHOOL	INTERVENE	INTERVENE
BROWARD	SUNLAND PARK ELEMENTARY SCHOOL	CORRECT II	CORRECT II
COLLIER	EDEN PARK ELEMENTARY SCHOOL*	NA	CORRECT II
COLLIER	IMMOKALEE HIGH SCHOOL	CORRECT II	CORRECT II
DADE	BOOKER T. WASHINGTON SENIOR HIGH	CORRECT II	CORRECT II
DADE	CHARLES R. DREW MIDDLE SCHOOL	CORRECT II	CORRECT II
DADE	DR. HENRY W. MACK/WEST LITTLE RIVER ELEMENTARY SCHOOL	CORRECT I	CORRECT II
DADE	FREDERICK R. DOUGLASS ELEMENTARY	CORRECT II	CORRECT II
DADE	HOLMES ELEMENTARY SCHOOL	INTERVENE	INTERVENE
DADE	HOMESTEAD SENIOR HIGH SCHOOL	CORRECT II	CORRECT II
DADE	LITTLE RIVER ELEMENTARY SCHOOL	CORRECT II	CORRECT II
DADE	MIAMI CAROL CITY SENIOR HIGH	CORRECT II	CORRECT II
DADE	MIAMI CENTRAL SENIOR HIGH SCHOOL	INTERVENE	INTERVENE
DADE	MIAMI EDISON MIDDLE SCHOOL	CORRECT II	CORRECT II
DADE	MIAMI EDISON SENIOR HIGH SCHOOL	INTERVENE	INTERVENE
DADE	MIAMI JACKSON SENIOR HIGH SCHOOL	CORRECT II	CORRECT II
DADE	MIAMI NORLAND SENIOR HIGH SCHOOL*	CORRECT II	CORRECT II
DADE	MIAMI NORTHWESTERN SENIOR HIGH	PREVENT II	CORRECT II
DADE	MIAMI SOUTHRIDGE SENIOR HIGH*	PREVENT II	CORRECT II
DADE	NORTH COUNTY ELEMENTARY SCHOOL	CORRECT II	CORRECT II
DADE	NORTH MIAMI MIDDLE SCHOOL	CORRECT II	CORRECT II
DADE	NORTH MIAMI SENIOR HIGH SCHOOL*	CORRECT II	CORRECT II

*Newly funded Title I schools for two years or less (not currently in need of improvement)

As of 12/02/2009

District Name	School Name	DA 2008	DA 2009
DADE	PINE VILLA ELEMENTARY SCHOOL	CORRECT II	INTERVENE
DUVAL	A. PHILIP RANDOLPH ACADEMIES*	PREVENT II	CORRECT II
DUVAL	ANDREW JACKSON HIGH SCHOOL*	CORRECT II	INTERVENE
DUVAL	EDWARD H. WHITE HIGH SCHOOL*	CORRECT II	CORRECT II
DUVAL	JEAN RIBAULT HIGH SCHOOL*	PREVENT II	INTERVENE
DUVAL	LONG BRANCH ELEMENTARY SCHOOL	CORRECT II	CORRECT II
DUVAL	NATHAN B. FORREST HIGH SCHOOL*	CORRECT II	CORRECT II
DUVAL	NORTH SHORE K-8	CORRECT II	INTERVENE
DUVAL	NORTHWESTERN MIDDLE SCHOOL	CORRECT II	CORRECT II
DUVAL	PAXON MIDDLE SCHOOL	CORRECT II	CORRECT II
DUVAL	SMART POPE LIVINGSTON ELEMENTARY	CORRECT II	CORRECT II
DUVAL	WILLIAM M. RAINES HIGH SCHOOL*	CORRECT II	INTERVENE
ESCAMBIA	WARRINGTON MIDDLE SCHOOL	INTERVENE	INTERVENE
GADSDEN	EAST GADSDEN HIGH SCHOOL	CORRECT II	CORRECT II
GADSDEN	WEST GADSDEN HIGH SCHOOL	CORRECT II	CORRECT II
HAMILTON	CENTRAL HAMILTON ELEMENTARY SCHOOL	CORRECT II	CORRECT II
HILLSBOROUGH	FRANKLIN MIDDLE MAGNET SCHOOL	INTERVENE	INTERVENE
HILLSBOROUGH	MIDDLETON HIGH SCHOOL	INTERVENE	INTERVENE
JEFFERSON	JEFFERSON COUNTY MIDDLE/HIGH SCHOOL	PREVENT II	INTERVENE
LEON	AMOS P. GODBY HIGH SCHOOL*	NA	CORRECT II
MADISON	MADISON COUNTY HIGH SCHOOL*	PREVENT II	CORRECT II
ORANGE	MEMORIAL MIDDLE SCHOOL	CORRECT II	CORRECT II
PALM BEACH	GLADES CENTRAL HIGH SCHOOL	CORRECT II	CORRECT II
PALM BEACH	LAKE WORTH HIGH SCHOOL*	NA	INTERVENE
PALM BEACH	ROSENWALD ELEMENTARY SCHOOL	CORRECT II	CORRECT II
POLK	OSCAR J. POPE ELEMENTARY SCHOOL	PREVENT II	CORRECT II

*Newly funded Title I schools for two years or less (not currently in need of improvement)

As of 12/02/2009

District Name	School Name	DA 2008	DA 2009
ST. JOHNS	ST. JOHNS TECHNICAL HIGH SCHOOL*	NA	CORRECT II

*Newly funded Title I schools for two years or less (not currently in need of improvement)

As of 12/02/2009

E5 - Comparison of Turnaround Options and Florida Differentiated Accountability Requirements

Turnaround Options	Florida Differentiated Accountability Interventions
Turnaround Model	
• Replace the Principal and grant the Principal sufficient operational flexibility to implement a fully comprehensive approach in order to substantially improve student achievement outcomes and increase high school graduation rates	• School's principal and assistant principals have a record of increasing student achievement. The principal must have a record of turning around a similar school. (Prevent II D, Correct II D and F, and Intervene) • District shall review members of the school leadership team, and replace them as necessary based upon overall school performance (Prevent I and II, Correct I, Correct II A, B, C, and D, and Intervene) • Department, with district assistance, will review the school leadership team. The Department will make recommendations to the district with respect to replacing members of the leadership team (Correct II F and D former F, and Intervene)
• Measure the effectiveness of staff who can work within the turnaround environment to meet the needs of students ○ Screen all existing staff and rehire no more than 50 percent ○ Select new staff	• The district shall not employ teachers for the school who are designated less than satisfactory by the teacher evaluation instrument (Prevent II D, Correct II F and D former F, and Intervene) • District must ensure performance appraisals of instructional personnel are primarily based on student achievement. (Prevent I and II, Correct I and II, and Intervene) • District must ensure that performance appraisals of the administrative team include student achievement, as measured by the FCAT, and goals related to targeted subgroups and school improvement (Prevent I and II, Correct I and II, and Intervene) • District must review and replace staff who have not contributed to learning gains (Prevent II and Correct II) • State must review teachers who have not contributed to increased learning gains with district assistance and replace those who have not contributed to increased learning gains as defined by 65% in reading and mathematics on FCAT (Correct F and D former F, and Intervene) • Department oversees the staffing of the school prior to the start of school (Correct II F and D former F, and Intervene)
• Implement such strategies as financial incentives, increased opportunities for promotion and career growth, and more flexible work conditions designed to recruit, place, and retain staff with skills to turnaround struggling schools	• The district shall provide administrators with performance pay for raising student achievement (Correct I Exiting Intervene, Correct II D and F, and Intervene) • District must develop a plan to encourage teachers with demonstrated mastery in improving student performance to remain or transfer to a D or F school (Prevent II, Correct II, and Intervene) • The district must provide teachers with performance pay for raising student achievement (Correct I Exiting Intervene, Correct II D and F, and Intervene) • District must implement a differentiated pay policy that includes differentiation based on district determined factors, including, but not limited to: additional job responsibilities, school demographics, critical shortage areas, and level of job performance difficulties (Correct I Exiting Intervene, Correct II F and D former F and Intervene)
• Provide staff with ongoing, high-quality, job-embedded professional development	• School must ensure Individual Professional Development Plans (IPDPs) for teachers and coaches of targeted subgroups. The IPDP

	must include professional development targeting for the needs of subgroups that did not meet AYP (Prevent I and Correct I) • Hiring instructional coaches in the areas of reading, mathematics, and science to assist teachers in the classroom with the planning and delivery of effective instruction and data analysis (Intervene, Correct II F, and Correct II D former F) • District ensures that IPDPs for teachers and coaches of targeted subgroups include professional development plans targeting the needs of subgroups not making AYP (Prevent II, Correct II, and Intervene) • District must ensure that Leadership professional development includes professional development targeting the needs of subgroups that did not meet AYP (Prevent I and II, Correct I and II, and Intervene) • District must ensure that appropriate resources are provided to support the school to redesign the master schedule to provide common planning time for data-based decision making within the Problem Solving process, job-embedded professional development, and Lesson Study (Prevent I and II, Correct I and II, and Intervene) • District must provide Leadership development on monitoring classroom instruction and evaluating professional development (Prevent I and II, Correct I and II, and Intervene) • District must provide professional development on Florida's Continuous Improvement Model, Response to Intervention, Lesson Study, and School Grade and AYP Calculations (Prevent I and II, Correct I and II, and Intervene)
• Adopt a new governance structure which may include hiring a "turnaround leader"	• RTTT requirement to be added to DA requirements for 2010-2011
• Use data to identify and implement an instructional program that is research-based and "vertically aligned" from one grade to the next	• District and School Advisory Council shall review school performance data and determine the causes of low performance (Prevent I and II, Correct I and II, F, D former F, and Intervene) • School shall complete a mid-year report to analyze progress and identify strategies for student intervention from the baseline to mid-year assessment (Prevent I and II, Correct I and II, and Intervene) • District shall review data to determine the effectiveness of all instructional programs and class offerings (Prevent I and II, Correct I and II, and Intervene) • Department will review data to determine the effectiveness of all instructional programs and class offerings (Correct II F and D former F, and Intervene)
• Promote continuous use of student data to inform and differentiate instruction in order to meet the academic needs of individual students	• District and School Advisory Council shall review school performance data and determine the causes of low performance (Prevent I and II, Correct I and II, F, D former F, and Intervene) • School shall complete a mid-year report to analyze progress and identify strategies for student intervention from the baseline to mid-year assessment. Results of data shall be analyzed through data chats between district administrators and principals; principals and teachers; and teachers and students (Prevent I and II, Correct I and II, and Intervene) • School shall administer screening diagnostics and must provide remediation, acceleration, and enrichment (Prevent I and II, Correct I and II, and Intervene)

	• District must prescribe formative (Benchmark mini-assessments) and summative (Benchmark baseline and mid-year) assessments in reading, mathematics, and science for Level 1-3 students (Prevent I and Correct I in subgroups not making AYP; school wide for Prevent II, Correct II, and Intervene) • District must monitor and analyze progress monitoring in reading, mathematics, and science through formative and summative assessments. (Prevent II, Correct II, and Intervene)
• Establish schedules and implement strategies that provide increased learning time	• Required for Intervene high schools for 2010-2011
• Provide appropriate social-emotional and community-oriented services and supports for students	• N/A
Restart Model	
• District converts a school or closes and reopens a school under a charter school operator, a charter management organization, or an education management organization that has been selected through a vigorous review process	• Districts must choose one of four Intervene options if Intervene schools fail to make adequate progress to move out of the Intervene category; one of the four Intervene options is to close and reopen as a charter or multiple charters; another option is to contract with an outside entity to operate the school (Intervene)
• A restart must enroll, within the grades it serves, any student who wishes to attend the school	• Districts must choose one of four Intervene options if Intervene schools fail to make adequate progress to move out of the Intervene category; one of the four Intervene options is to close and reopen as a charter or multiple charters; another option is to contract with an outside entity to operate the school (Intervene) • Students in these schools are welcome to attend under the new structure
School Closure	
• LEA closes a school and enrolls the students who attended the school in other schools in the LEA that are high achieving. Other schools may be charters or new schools for which data is not yet available.	• Districts must choose one of four Intervene options if Intervene schools fail to make adequate progress to move out of the Intervene category; one of the four Intervene options is to reassign students to another school and monitor the student's progress (Intervene)
Transformation Model – Required Activities	
• Replace the Principal who led the school prior to commencement of the transformation model	• School's principal and assistant principals have a record of increasing student achievement. The principal must have a record of turning around a similar school. (Prevent II D, Correct II D and F, and Intervene) • District must ensure that performance appraisals of the administrative team include student achievement, as measured by the FCAT, and goals related to targeted subgroups and school improvement (Prevent I and II, Correct I and II, and Intervene)
• Use rigorous, transparent, and equitable evaluation systems for teachers and Principals that o Data on student growth as well as other factors o Are designed and developed with	• District must ensure performance appraisals of instructional personnel are primarily based on student achievement. (Prevent I and II, Correct I and II, and Intervene) • District must ensure that performance appraisals of the administrative team include student achievement, as measured by the FCAT, and goals related to targeted subgroups and school

significant teacher and Principal involvement	improvement (Prevent I and II, Correct I and II, and Intervene)
• Identify and reward school leaders, teachers, and staff who have helped to increase student achievement	• The district shall provide administrators with performance pay for raising student achievement (Correct I Exiting Intervene, Correct II D and F, and Intervene) • District must develop a plan to encourage teachers with demonstrated mastery in improving student performance to remain or transfer to a D or F school (Prevent II, Correct II, and Intervene) • District must ensure performance appraisals of instructional personnel are primarily based on student achievement. (Prevent I and II, Correct I and II, and Intervene) • District must ensure that performance appraisals of the administrative team include student achievement, as measured by the FCAT, and goals related to targeted subgroups and school improvement (Prevent I and II, Correct I and II, and Intervene) • The district must provide teachers with performance pay for raising student achievement (Correct I Exiting Intervene, Correct II D and F, and Intervene) • District must implement a differentiated pay policy that includes differentiation based on district determined factors, including, but not limited to: additional job responsibilities, school demographics, critical shortage areas, and level of job performance difficulties (Correct I Exiting Intervene, Correct II F and D former F and Intervene)
• Remove school leaders, teachers, and staff who, after ample opportunities, have not increased student achievement	• District shall review members of the school leadership team, and replace them as necessary based upon overall school performance (Prevent I and II, Correct I, Correct II A, B, C, and D, and Intervene) • Department, with district assistance, will review the school leadership team. The Department will make recommendations to the district with respect to replacing members of the leadership team (Correct II F and D former F, and Intervene) • The district shall not employ teachers for the school who are designated less than satisfactory by the teacher evaluation instrument (Prevent II D, Correct II F and D former F, and Intervene) • District must ensure performance appraisals of instructional personnel are primarily based on student achievement. (Prevent I and II, Correct I and II, and Intervene) • District must ensure that performance appraisals of the administrative team include student achievement, as measured by the FCAT, and goals related to targeted subgroups and school improvement (Prevent I and II, Correct I and II, and Intervene) • District must review and replace staff who have not contributed to learning gains (Prevent II and Correct II) • State must review teachers who have not contributed to increased learning gains with district assistance and replace those who have not contributed to increased learning gains as defined by 65% in reading and mathematics on FCAT (Correct F and D former F, and Intervene) • Department oversees the staffing of the school prior to the start of school (Correct II F and D former F, and Intervene)
• Provide staff with ongoing, high-quality,	• School must ensure Individual Professional Development Plans

job-embedded professional development	(IPDPs) for teachers and coaches of targeted subgroups. The IPDP must include professional development targeting for the needs of subgroups that did not meet AYP (Prevent I and Correct I) • Hiring instructional coaches in the areas of reading, mathematics, and science to assist teachers in the classroom with the planning and delivery of effective instruction and data analysis (Intervene, Correct II F, and Correct II D former F) • District ensures that IPDPs for teachers and coaches of targeted subgroups include professional development plans targeting the needs of subgroups not making AYP (Prevent II, Correct II, and Intervene) • District must ensure that Leadership professional development includes professional development targeting the needs of subgroups that did not meet AYP (Prevent I and II, Correct I and II, and Intervene) • District must ensure that appropriate resources are provided to support the school to redesign the master schedule to provide common planning time for data-based decision making within the Problem Solving process, job-embedded professional development, and Lesson Study (Prevent I and II, Correct I and II, and Intervene) • District must provide Leadership development on monitoring classroom instruction and evaluating professional development (Prevent I and II, Correct I and II, and Intervene) • District must provide professional development on Florida's Continuous Improvement Model, Response to Intervention, Lesson Study, and School Grade and AYP Calculations (Prevent I and II, Correct I and II, and Intervene)
• Implement strategies such as financial incentives, increased opportunities for promotion and career growth, and more flexible work conditions designed to recruit, place, and retain staff with the skills necessary to meet the needs of students in a transformation school	• The district shall provide administrators with performance pay for raising student achievement (Correct I Exiting Intervene, Correct II D and F, and Intervene) • District must develop a plan to encourage teachers with demonstrated mastery in improving student performance to remain or transfer to a D or F school (Prevent II, Correct II, and Intervene) • The district must provide teachers with performance pay for raising student achievement (Correct I Exiting Intervene, Correct II D and F, and Intervene) • District must implement a differentiated pay policy that includes differentiation based on district determined factors, including, but not limited to: additional job responsibilities, school demographics, critical shortage areas, and level of job performance difficulties (Correct I Exiting Intervene, Correct II F and D former F and Intervene) • District to implement an extended day in Intervene high schools to increase learning time
• Use data to identify and implement an instructional program that is research-based and "vertically aligned" from one grade to the next as well as aligned with state academic standards	• District and School Advisory Council shall review school performance data and determine the causes of low performance (Prevent I and II, Correct I and II, F, D former F, and Intervene) • School shall complete a mid-year report to analyze progress and identify strategies for student intervention from the baseline to mid-year assessment (Prevent I and II, Correct I and II, and Intervene) • District shall review data to determine the effectiveness of all instructional programs and class offerings (Prevent I and II, Correct

	I and II, and Intervene) • Department will review data to determine the effectiveness of all instructional programs and class offerings (Correct II F and D former F, and Intervene)
• Promote the continuous use of student data to inform and differentiate instruction in order to meet the academic needs of individual students	• District and School Advisory Council shall review school performance data and determine the causes of low performance (Prevent I and II, Correct I and II, F, D former F, and Intervene) • School shall complete a mid-year report to analyze progress and identify strategies for student intervention from the baseline to mid-year assessment. Results of data shall be analyzed through data chats between district administrators and principals; principals and teachers; and teachers and students (Prevent I and II, Correct I and II, and Intervene) • School shall administer screening diagnostics and must provide remediation, acceleration, and enrichment (Prevent I and II, Correct I and II, and Intervene) • District must prescribe formative (Benchmark mini-assessments) and summative (Benchmark baseline and mid-year) assessments in reading, mathematics, and science for Level 1-3 students (Prevent I and Correct I in subgroups not making AYP; school wide for Prevent II, Correct II, and Intervene) • District must monitor and analyze progress monitoring in reading, mathematics, and science through formative and summative assessments. (Prevent II, Correct II, and Intervene)
• To increase learning, districts must establish schedules and implement strategies that provide increased learning time	• District must ensure that appropriate resources are provided to support the school to redesign the master schedule to provide common planning time for data-based decision making within the Problem Solving process, job-embedded professional development, and Lesson Study (Prevent I and II, Correct I and II, and Intervene)
• Provide ongoing mechanisms for family and community engagement	• The district shall recruit representatives of the community to establish a Community Assessment Team (CAT) to review school performance data, determine the cause for low performance for each school with a grade of F and each school in the Intervene category, and advise the district on its District Improvement and Assistance Plan. The Department's Regional Executive Directors shall participate in CAT meetings. (Correct II F and Intervene)
• Districts must give schools sufficient operational flexibility to implement fully a comprehensive and sustainable student achievement system	• Department does not dictate curriculum or programs selected; however, we review the effectiveness of previously used curriculum and programs
• Ensure schools receive ongoing intensive technical assistance	• Purpose and role of DA Regional Teams
Transformational Model – Permissible Activities	
• Provide additional compensation to attract and retain staff with the skills necessary to transform a struggling school	• District must ensure performance appraisals of instructional personnel are primarily based on student achievement. (Prevent I and II, Correct I and II, and Intervene) • District must ensure that performance appraisals of the administrative team include student achievement, as measured by the FCAT, and goals related to targeted subgroups and school improvement (Prevent I and II, Correct I and II, and Intervene)

	• District shall provide administrators with performance pay for raising student achievement (Correct I Exiting Intervene, Correct II D and F, and Intervene) • The district must provide teachers with performance pay for raising student achievement (Correct I Exiting Intervene, Correct II D and F, and Intervene) • District must implement a differentiated pay policy that includes differentiation based on district determined factors, including, but not limited to: additional job responsibilities, school demographics, critical shortage areas, and level of job performance difficulties (Correct I Exiting Intervene, Correct II F and D former F and Intervene)
• Institute a system for measuring changes in instructional practices resulting from professional development	• Mid-year assessments and FCIM are used to measure changes in instructional practices
• Ensure that a school is not required to accept a teacher without the mutual consent of the teacher and Principal, regardless of the teacher's seniority	• Will be included in Race to the Top/Student Improvement Grant
• Conduct periodic reviews to ensure the curriculum is implemented with fidelity and is having the intended impact on student achievement	• District must provide Leadership development on monitoring classroom instruction and evaluating professional development (Prevent I and II, Correct I and II, and Intervene) • School must provide quarterly updates on the implementation of the School Improvement Plan to the school advisory council and make updates to the School Improvement Plan (Prevent I and II, Correct I and II, and Intervene) • School leadership team must monitor implementation of the School Improvement Plan (Prevent I and II, Correct I and II, and Intervene) • School must participate in a comprehensive instructional monitoring process (Prevent I and II, Correct I and II, and Intervene) • District must develop a comprehensive instructional monitoring process and follow-up that includes classroom, team, and school-wide monitoring (Prevent I and II, Correct I and II, and Intervene) • Department shall conduct a comprehensive instructional monitoring process and report bi-monthly to the State Board of Education (Correct I Exiting Intervene, Correct II F and D former F, and Intervene)
• Implement a school wide "Response to Intervention" model	• School must plan for the implementation of Florida's Response to Intervention model set forth in the Statewide RtI Implementation Plan (Prevent I and II, Correct I and II, and Intervene)
• Provide additional supports and professional development to teachers and principals in order to implement effective strategies to support students with disabilities in the least restrictive environment and to ensure that limited English proficient students acquire language skills to master academic content	• School must ensure Individual Professional Development Plans (IPDPs) for teachers of targeted subgroups. The IPDP must include professional development targeting for the needs of subgroups that did not meet AYP (Prevent I and Correct I) • District ensures that IPDPs for teachers of targeted subgroups include professional development plans targeting the needs of subgroups not making AYP (Prevent II, Correct II, and Intervene) • District must ensure that Leadership professional development includes professional development targeting the needs of subgroups that did not meet AYP (Prevent I and II, Correct I and II, and Intervene) • District must ensure that appropriate resources are provided to

	support the school to redesign the master schedule to provide common planning time for data-based decision making within the Problem Solving process, job-embedded professional development, and Lesson Study (Prevent I and II, Correct I and II, and Intervene)
• Use and integrate technology-based supports and interventions as part of the instructional program	• District use various technology-based support and interventions in reading, math, and science. These are selected by districts and schools and reviewed for effectiveness by the Department
• In secondary schools, increase rigor by offering advanced coursework opportunities	• School shall ensure that students are properly placed in rigorous coursework (Prevent I and II, Correct I and II, and Intervene)
• In secondary schools, improve student transition from middle to high school	• N/A
• In secondary schools, increase graduation rates through the implementation of various programs	• As a requirement of new high school accountability, schools will be graded based on the number of students enrolled and passing advanced courses and graduation rates. • Initiative for RTTT and SIG funds.
• In secondary schools, establish early warning systems to identify students who may be at risk of failing to achieve high standards or graduate	• Statewide initiative for RTTT application for data systems
• Partner with various organizations to create safe-school environments	• Initiatives for RTTT/SIG funds
• Extend or restructure the school day to add time for additional activities, such as advisory periods	• DA requirement for Intervene high schools in 2010-2011
• Implement approaches to improve school climate and discipline, such as positive behavioral supports or taking steps to eliminate bullying	• School must plan for the implementation of Florida's Response to Intervention model set forth in the Statewide RtI Implementation Plan (Prevent I and II, Correct I and II, and Intervene) • Targeted initiatives for RTTT funds and School Improvement Grants in RTTT application
• Expand the school program to offer full-day kindergarten or pre-kindergarten	• N/A
• Allow school to be run under a new governance arrangement	• Districts must choose one of four Intervene options if Intervene schools fail to make adequate progress to move out of the Intervene category; one of the four Intervene options is to reassign students to another school and monitor the student's progress (Intervene)
• Implement a per-pupil school-based budget formula that is weighted based on student needs	• The Department will review budget allocations and alignment of resources. (Correct I Exiting Intervene, Correct II F and D former F, and Intervene)

E-6: Strategies and Support for Differentiated Accountability

SCHOOL IMPROVEMENT PLANNING					
	Prevent I	**Correct I**	**Prevent II**	**Correct II**	**Intervene**
The district must create a district-based leadership team that includes the superintendent, associate superintendent(s) of curriculum, general and special education leaders, curriculum specialists, behavior specialists, student services personnel, human resources and professional development leaders, and specialists in other areas relevant to the school's circumstances, such as assessment, English language learners, and gifted learners. The team shall develop, support, and facilitate the implementation of policies and procedures that guide school-based teams with direct support systems for each school principal, and shall plan for systems of change toward Problem Solving and Response to Instruction/Intervention (RtI) through district-wide consensus building, infrastructure development, and implementation.	X	X	X	X	X
In conjunction with the district-based leadership team, the School Advisory Council shall assist the school leadership team in the development of the School Improvement Plan. The district-based leadership team is responsible for ensuring the School Improvement Plan is implemented.	X *	X *	X *	X *	X
* Unless a waiver is granted under 6A-1.099811(6) F.A.C.					
The School Advisory Council shall review school performance data and determine the causes of low performance. The School Advisory Council shall advise the school on its School Improvement Plan.	X	X	X	X	X
The School Improvement Plan shall be approved by the district through peer review.	X	X	X	X	X
The district-based leadership team shall monitor implementation of the School Improvement Plan.	X	X	X	X	X

SCHOOL IMPROVEMENT PLANNING					
	Prevent I	**Correct I**	**Prevent II**	**Correct II**	**Intervene**
The Department will review, approve, and monitor School Improvement Plans.		X (Exiting Intervene in 2008-2009)		X (F, D former F in 2007-2008.)	X
The district shall recruit representatives of the community to establish a Community Assessment Team (CAT) to review school performance data, determine the cause for low performance for each school with a grade of F and each school in the Intervene category, and advise the district on its District Improvement and Assistance Plan. The Department's Regional Executive Directors shall participate in CAT meetings.				X (F only)	X

The district shall develop and implement a District Improvement and Assistance Plan.	X	X	X	X	X
The Department will review budget allocations and alignment of resources.		X (Exiting Intervene in 2008-2009)		X (F, D former F in 2007-2008)	X
The school shall complete a mid-year report to analyze progress and identify strategies for student intervention from the baseline to mid-year assessment.	X *	X *	X *	X *	X
* Non-Title I A, B, and C schools are required to complete the report only for subgroups not making AYP.					

LEADERSHIP					
	Prevent I	**Correct I**	**Prevent II**	**Correct II**	**Intervene**
The school's principal and assistant principals have a record of increasing student achievement. The principal must have a record of turning around a similar school.			X (D only)	X (D and F)	X
The district shall review members of the school leadership team, and replace them as necessary based upon overall school performance.	X	X	X	X (A, B, C, and D- not D former F in 2007-2008)	
The Department, with district assistance, will review the school leadership team. The Department will make recommendations to the district with respect to replacing members of the leadership team.*				X (F, D former F in 2007-2008)	X
The following guidelines should be considered when determining if a change in leadership is necessary: • The school grade declines or there is consistent failure (D or F) under the same leadership for 2 years - The principal should be replaced. • The school grade declines under the same leadership for 1 year and the percentage of Annual Yearly Progress (AYP) Criteria Met decreases - The principal should be replaced. • The school grade declines under the same leadership for 1 year but the learning gains in reading and mathematics increase - The principal has one more year to show growth. • The school grade declines under the same leadership for 1 year and the percentage of AYP Criteria Met increases - The principal has one more year to show growth. • The school grade declines under the same leadership for 1 year and the learning gains in reading and mathematics declines - The principal should be replaced.					
The district shall provide administrators with performance pay for raising student achievement.		X (Exiting Intervene in 2008-2009)		X (D and F)	X

EDUCATOR QUALITY					
	Prevent I	**Correct I**	**Prevent II**	**Correct II**	**Intervene**
Teachers assigned to subgroups not making AYP must be highly qualified and certified in-field.	X	X	X	X	X
All paraprofessionals must be highly qualified.	X *	X *	X *	X *	X *

* By the 2011-2012 school year, non-Title I schools are required to have highly-qualified paraprofessionals, as defined by No Child Left Behind (NCLB), who instruct subgroups who did not make AYP.					
The district shall not employ teachers for the school who are designated less than satisfactory by the teacher evaluation instrument.			X (D)	X (F, D former F in 2007-2008)	X
The school must be fully staffed by the first day of school.			X	X	X
The district must develop a plan to encourage teachers with demonstrated mastery in improving student performance to remain or transfer to a D or F school.			X	X	X
The district must provide a reading endorsed reading coach and a math or science coach to develop and model effective lessons, to lead Lesson Study (LS), and to analyze data (note: Science coaches need only be provided if a school's mastery is less than 50% on FCAT science).		X (Exiting Intervene 2008-2009)*		X (D and F) *	X
* The district may receive a waiver from the Department if the district can demonstrate how sustained and direct support will be provided to teachers at the Correct I schools that Exited Intervene in 2008-2009 and Correct II D and F schools.					
Reading coaches must maintain a daily log of activities on the Progress Monitoring and Reporting Network (PMRN) and the school and district leadership teams must monitor these logs. The district must ensure that coaches do not provide pull-out instruction outside the context of providing professional development for teachers and do not teach more than one class.	X	X	X	X	X

EDUCATOR QUALITY					
	Prevent I	**Correct I**	**Prevent II**	**Correct II**	**Intervene**
The district must ensure performance appraisals of instructional personnel are primarily based on student achievement.	X	X	X	X	X
The district must ensure that performance appraisals of the administrative team include student achievement, as measured by the FCAT, and goals related to targeted subgroups and school improvement.	X	X	X	X	X
The district must train staff on performance appraisal instruments, and ensure that the performance appraisal process is implemented with fidelity.	X	X	X	X	X
The district must provide teachers with performance pay for raising student achievement.		X (Exiting Intervene 2008-2009)		X (D and F)	X
The district must review and replace staff who have not contributed to learning gains.			X	X	
The state must review teachers who have not contributed to increased learning gains with district assistance and replace those who have not contributed to increased learning gains as defined by 65% in reading and				X (F, D former F in 2007-2008)	X

mathematics on FCAT.					
The Department oversees the staffing of the school prior to the start of school.				X (F, D former F in 2007-2008)	X
The district must implement a differentiated pay policy that includes differentiation based on district determined factors, including, but not limited to: additional job responsibilities, school demographics, critical shortage areas, and level of job performance difficulties.		X (Exiting Intervene in 2008-2009)		X (D and F)	X
The district must ensure that mid-year vacancies are filled.	X	X	X	X	X
The district may declare an emergency to renegotiate collective bargaining agreements.			X	X	X

PROFESSIONAL DEVELOPMENT					
	Prevent I	**Correct I**	**Prevent II**	**Correct II**	**Intervene**
The school must ensure Individual Professional Development Plans (IPDPs) for teachers of targeted subgroups. The IPDP must include professional development targeting for the needs of subgroups that did not meet AYP.	X	X			
The district ensures that IPDPs for teachers of targeted subgroups include professional development plans targeting the needs of subgroups not making AYP.			X	X	X
The district must participate in a sample of IPDP meetings.			X	X	X
The district must ensure that Leadership professional development includes professional development targeting the needs of subgroups that did not meet AYP.	X	X	X	X	X
The district must ensure that appropriate resources are provided to support the school to redesign the master schedule to provide common planning time for data-based decision making within the Problem Solving process, job-embedded professional development, and Lesson Study.	X	X	X	X	X
The district must provide Leadership development on monitoring classroom instruction and evaluating professional development.	X	X	X	X	X
The district must provide professional development on Florida's Continuous Improvement Model, Response to Intervention, Lesson Study, and School Grade and AYP Calculations.	X	X	X	X	X

CURRICULUM ALIGNED AND PACED					
	Prevent I	**Correct I**	**Prevent II**	**Correct II**	**Intervene**

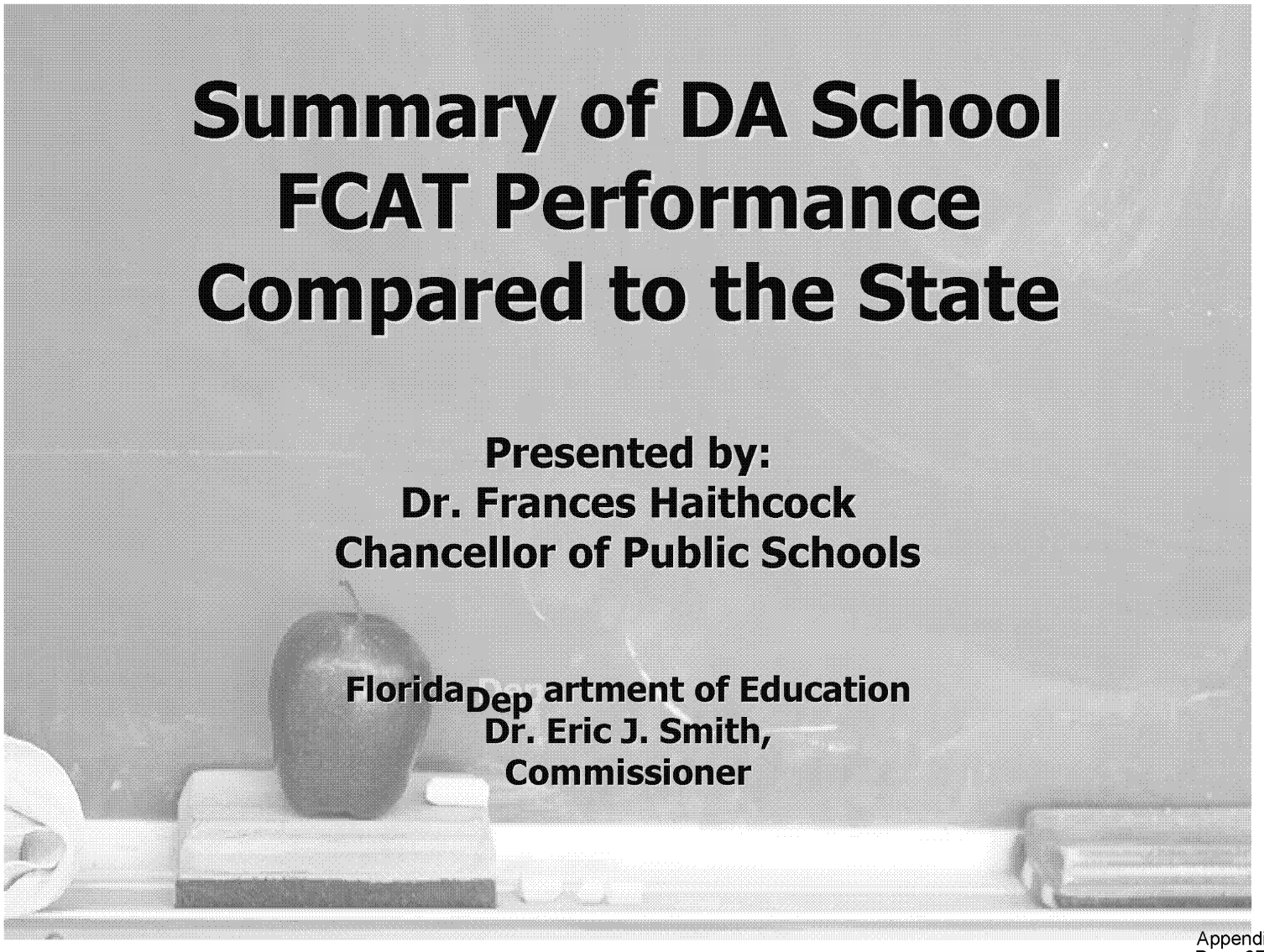
The school must identify and implement state-adopted instructional materials for all subject areas taught.	X *	X *			
The district must identify and the school must implement state-adopted evidence-based instructional materials.			X *	X *	X *
* The requirement that purchases of instructional materials be made within the first two years of the 2008-2009 adoption cycle is waived for Prevent I, Prevent II, and Correct I schools. This includes instructional materials for language arts, literature, and ESOL. Correct II and Intervene schools must continue to make these purchases within the first two years of the adoption cycle; however, the district shall receive a waiver from the Department if the district can demonstrate a strong rationale for continuing use of the materials currently in place based upon data that demonstrates improved student achievement as a result of the effective use of the materials.					
District or school develops instructional pacing guide that is aligned to the Next Generation Sunshine State Standards in reading, mathematics, and science.			X	X	X
The Department will review the instructional pacing guide aligned to the Next Generation Sunshine State Standards.		X (Exiting Intervene in 2008-2009)		X (F, D former F in 2007-2008)	X
The school shall ensure that students are properly placed in rigorous coursework.	X	X	X	X	X
The school must implement the district K-12 Reading Plan with fidelity.	X	X	X	X	X
The district must implement the K-12 Reading Plan with fidelity.	X	X	X	X	X
The district shall review data to determine the effectiveness of all instructional programs and class offerings.	X	X	X	X	X
The Department will review data to determine the effectiveness of all instructional programs and class offerings.				X (F, D former F in 2007-2008)	X

FLORIDA'S CONTINUOUS IMPROVEMENT MODEL					
	Prevent I	**Correct I**	**Prevent II**	**Correct II**	**Intervene**
The school must plan for the implementation of Florida's Response to Intervention model set forth in the Statewide RtI Implementation Plan.	X	X	X	X	X
The school must implement Florida's Continuous Improvement Model (FCIM).	X (FCIM implemented with subgroups not making AYP)	X (FCIM implemented with subgroups not making AYP)	X (FCIM implemented school-wide)	X (FCIM implemented school-wide)	X (FCIM implemented school-wide)
The district must monitor implementation of Florida's Continuous Improvement Model (FCIM).	X (FCIM implemented with subgroups not making AYP)	X (FCIM implemented with subgroups not making AYP)	X (FCIM implemented school-wide)	X (FCIM implemented school-wide)	X (FCIM implemented school-wide)
The school shall administer screening diagnostics and must provide remediation, acceleration, and enrichment.	X	X	X	X	X

The district must ensure real-time access to student achievement data.	X	X	X	X	X
The district must prescribe formative (Benchmark mini-assessments) and summative (Benchmark baseline and mid-year) assessments in reading, mathematics, and science for Level 1-3 students.	X (Only subgroups not making AYP)	X (Only subgroups not making AYP)	X (School wide)	X (School wide)	X (School wide)
The district must monitor and analyze progress monitoring in reading, mathematics, and science through formative and summative assessments. In the area of reading, this requirement may be fulfilled through the use of the Florida Assessments for Instruction in Reading (FAIR).			X	X	X
The district must participate in the Florida Assessments for Instruction in Reading (FAIR) for Levels 1-3 students.				X *	X *
* The district may receive a waiver from the Department if the district can demonstrate that the current reading assessment used by the district in Correct II and Intervene schools is reliable, aligned to the NGSSS Benchmarks, and predicts FCAT performance.					
The district administration must ensure that data chats are conducted between district administration and school administration, school administration and teachers, and teachers and students following baseline, mini-, and mid-year assessments.	X	X	X	X	X

MONITORING PROCESSES AND PLANS					
	Prevent I	**Correct I**	**Prevent II**	**Correct II**	**Intervene**
The school must provide quarterly updates on the implementation of the School Improvement Plan to the school advisory council and make updates to the School Improvement Plan.	X	X	X	X	X
The school leadership team must monitor implementation of the School Improvement Plan.	X	X	X	X	
The school must participate in a comprehensive instructional monitoring process.	X	X	X	X	X
The school must report prescribed reading progress monitoring three times per year using the Progress Monitoring and Reporting Network (PMRN).	X	X	X	X	X
The district must develop a comprehensive instructional monitoring process and follow-up that includes classroom, team, and school-wide monitoring.	X	X	X	X	X
The district must ensure that schools demonstrating the greatest need, based on data analysis, receive the highest percentage of resources.			X	X	X
The Department shall conduct a comprehensive instructional monitoring process.		X (Exiting Intervene in 2008-2009)		X (F, D former F in 2007-2008)	X
The Department will report progress bi-monthly to the State Board of Education.		X (Exiting Intervene in 2008-2009)		X (F, D former F in 2007-2008)	X

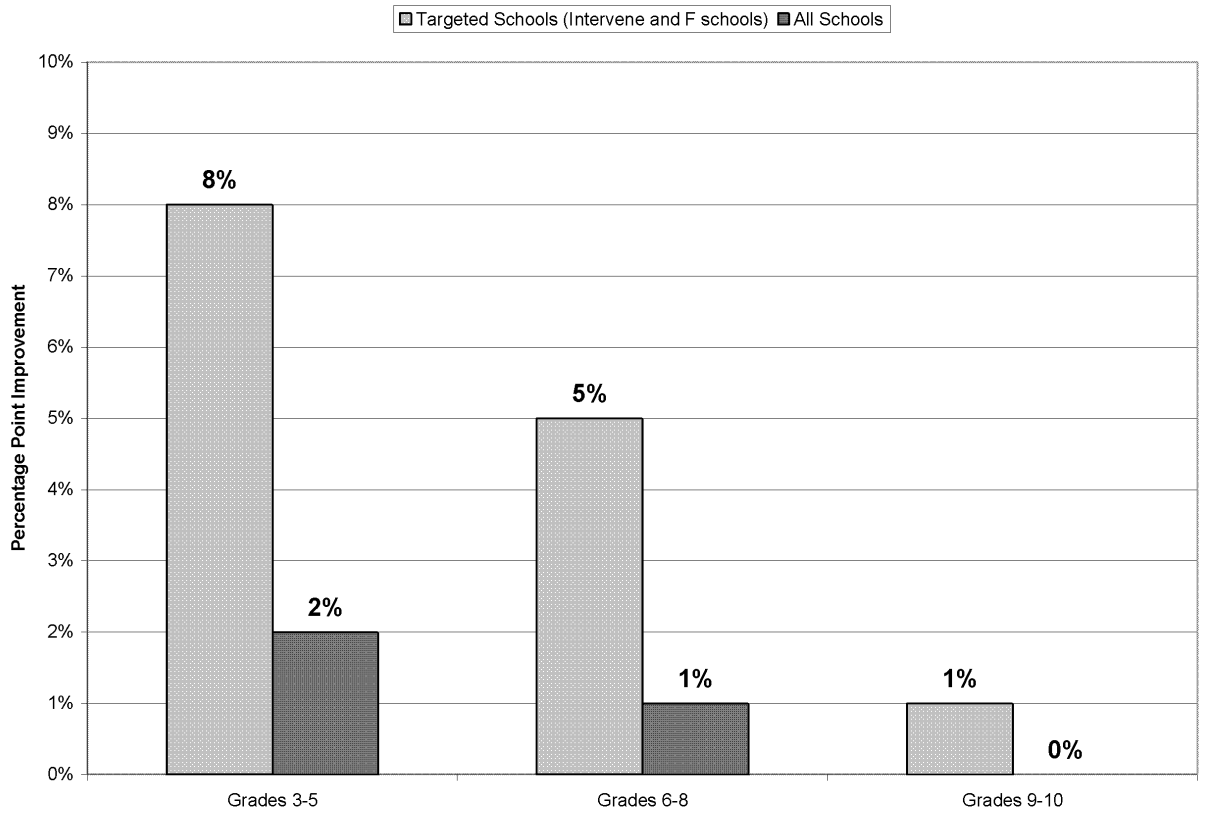
E-7: SUMMARY OF DA SCHOOL FCAT PERFORMANCE COMPARED TO THE STATE


Summary of DA School FCAT Performance Compared to the State
Presented by:
Dr. Frances Haithcock
Chancellor of Public Schools
Florida Department of Education
Dr. Eric J. Smith,
Commissioner

DA Schools Academic Growth

- **DA schools showed more improvements than the state**
- **Schools that received direct support, Intervene & F Schools, showed even more growth**

Growth from 2008 to 2009 of Students Scoring 3 + on FCAT Reading



Growth from 2008 to 2009 of Students Scoring 3 + on FCAT Reading

Grades 3-5

- 72% of Intervene and F Schools Showed Growth

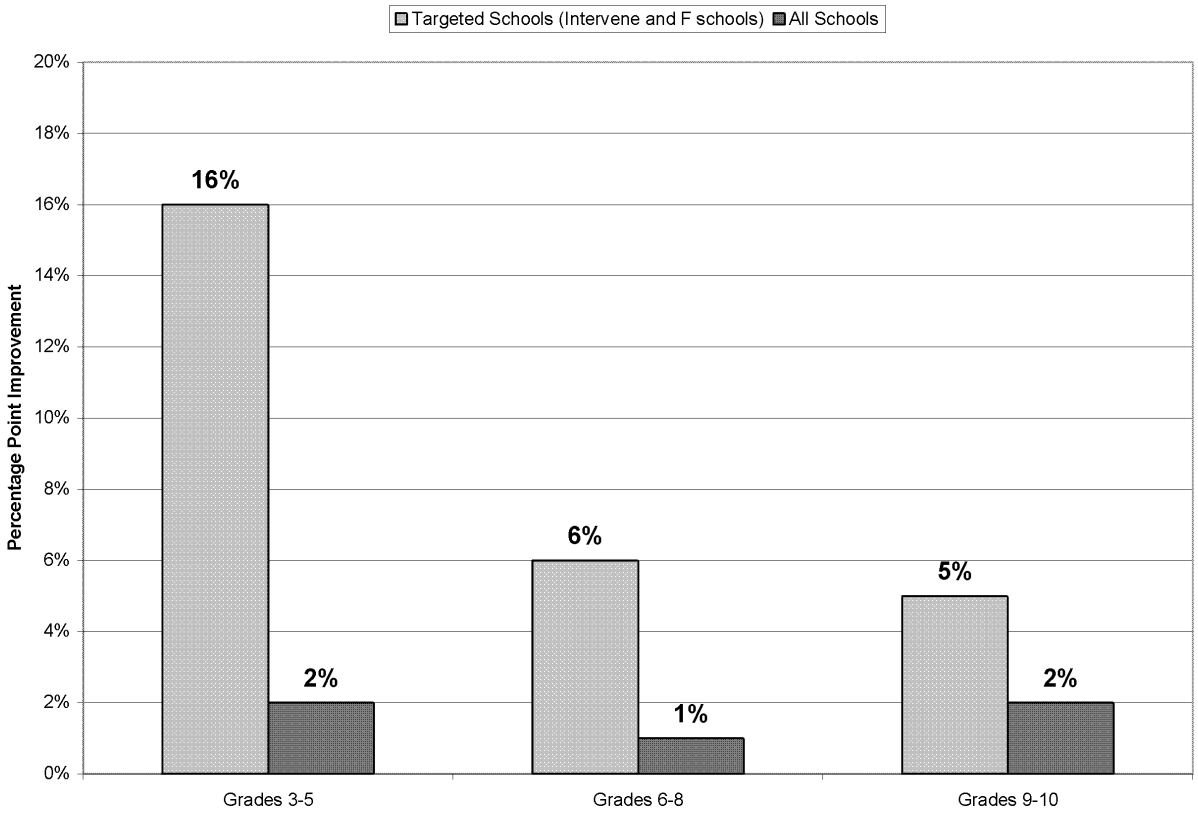
Grades 6-8

- 71% of Intervene and F Schools Showed Growth

Grades 9-10

- 56% of Intervene and F Schools Showed Growth

Growth from 2008 to 2009 of Students Scoring 3 + on FCAT Mathematics



Growth from 2008 to 2009 of Students Scoring 3 + on FCAT Mathematics

Grades 3-5

- 83% of Intervene and F Schools Showed Growth

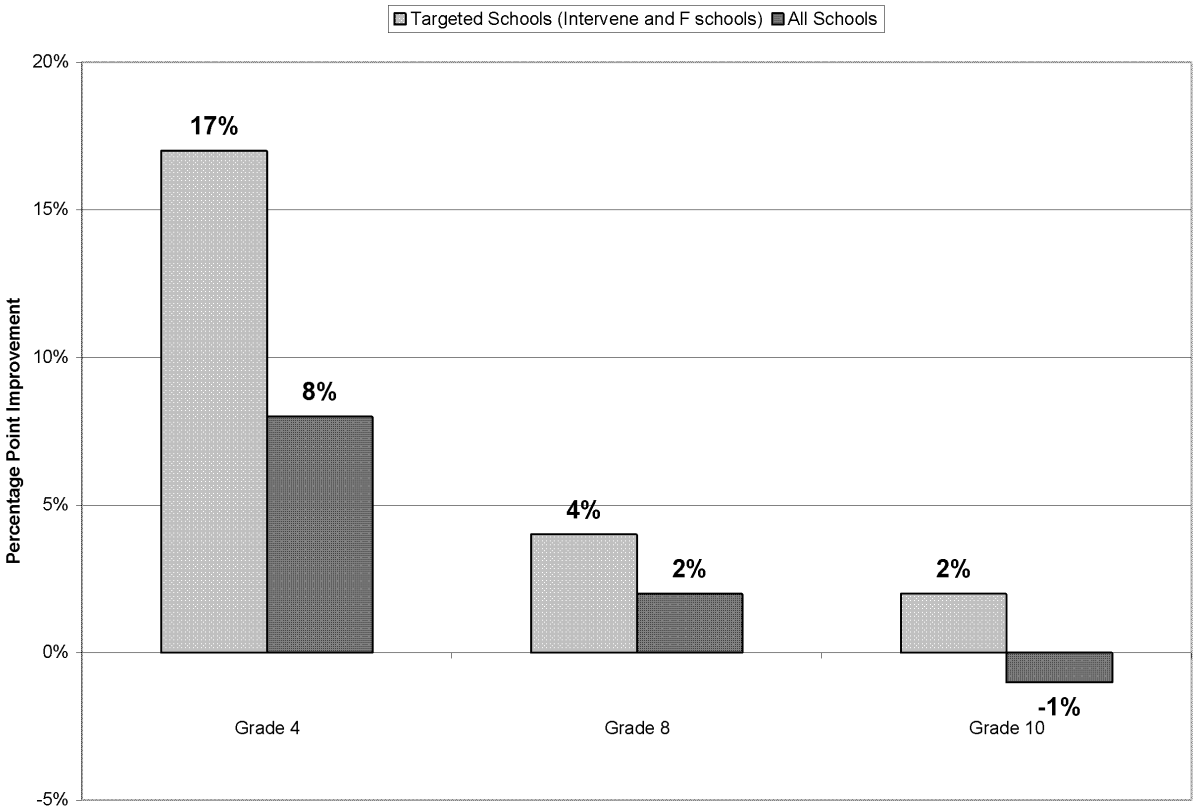
Grades 6-8

- 86% of Intervene and F Schools Showed Growth

Grades 9-10

- 69% of Intervene and F Schools Showed Growth

Growth from 2008 to 2009 of Students Scoring 3.5 + on FCAT Writing



Growth from 2008 to 2009 of Students Scoring 3.5 + on FCAT Writing

Grade 4

- 83% of Intervene and F Schools Showed Growth

Grade 8

- 100% of Intervene and F Schools Showed Growth

Grade 10

- 38% of Intervene and F Schools Showed Growth

DA Schools' Grades and AYP Status

- **79% of Intervene & F Schools Improved total AYP %**
- **79% of Intervene & F Schools Improved School Grade by 1 or more letter grades**
- **38% of Intervene & F Schools Improved School Grade by 2 or more letter grades**
- **6 Elementary Schools increased from "F" to "A" and made 100% AYP**
  - **Dade – Liberty City Elementary School**
  - **Dade – Miami Community Charter School**
  - **Escambia – George S. Hallmark Elementary School**
  - **Escambia – Navy Point Elementary School**
  - **Orange – Mollie E. Ray Elementary School**
  - **Putnam – William D. Mosley Elementary School**

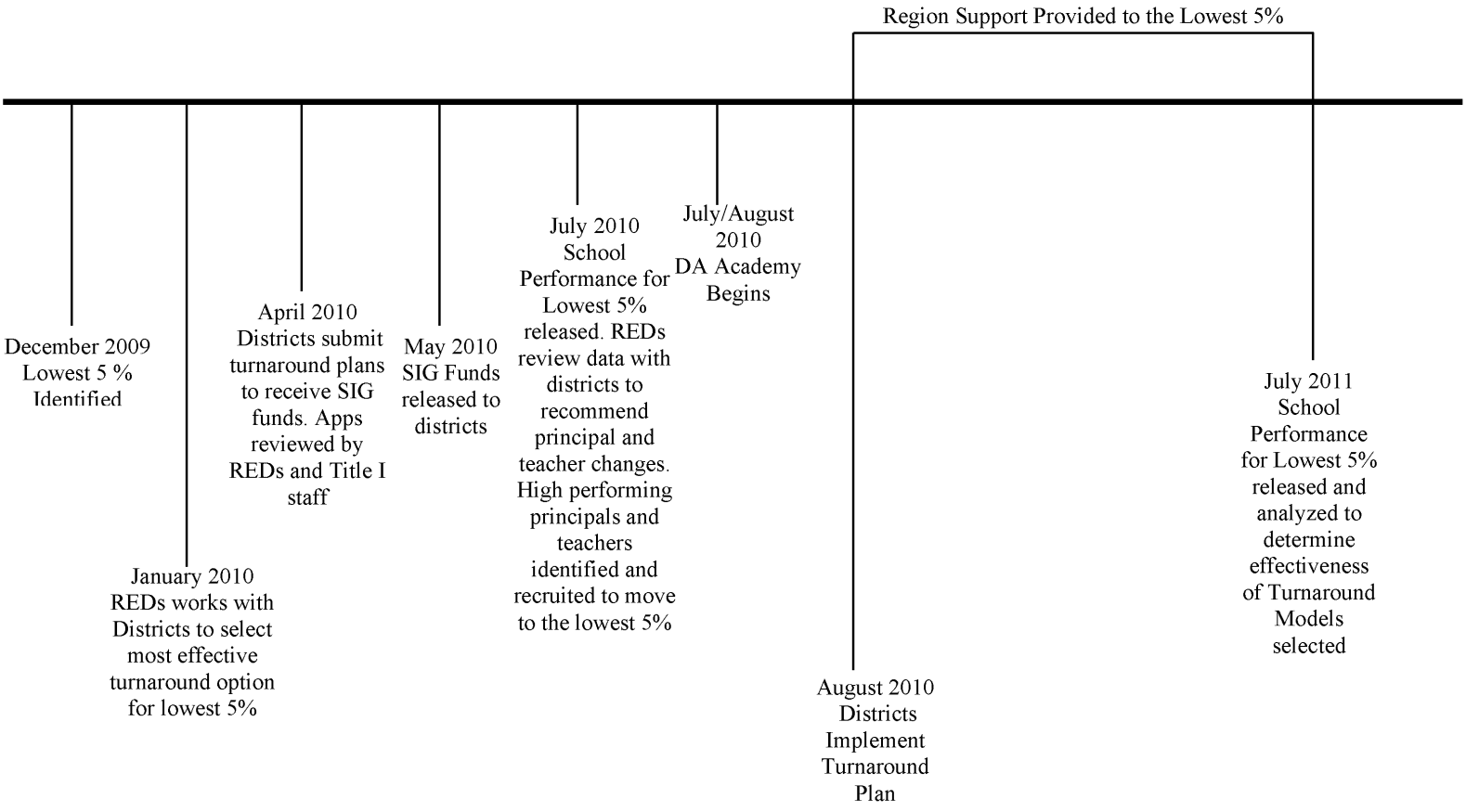
E-8: 2008-2009 Progress in Targeted Schools

REGION	DISTRICT	SCHOOL	TARGETED STATUS	2008 School Grade	2008 AYP Criteria Met	2008 DA Category	2009 School Grade	Change in School Grade	2009 AYP Criteria Met	Change in AYP % Points	2009 DA Category	Reading +/- meeting high standards	Math +/- meeting high standards	Writing +/- meeting high standards	Science +/- meeting high standards	Reading +/- making learning gains	Math +/- making learning gains
1	ESCAMBIA	WARRINGTON MIDDLE SCHOOL	INTERVENE	D	69	INTERVENE	C	+ 1 Letter Grade	82	+13	INTERVENE	+8	+3	+1	+1	+10	+5
1	LEON	BELLE VUE MIDDLE SCHOOL	INTERVENE	D	72	INTERVENE	C	+ 1 Letter Grade	82	+10	INTERVENE	+1	+5	+6	0	+5	+6
1	ESCAMBIA	GEORGE S. HALLMARK ELEMENTARY	F	F	82	CORRECT II	A	+ 4 Letter Grades	100	+18	PREVENT I	+21	+25	+24	+36	+14	+8
1	ESCAMBIA	NAVY POINT ELEMENTARY SCHOOL	F	F	77	CORRECT II	A	+ 4 Letter Grades	100	+23	CORRECT I	+17	+29	+45	+2	+27	+33
1	GADSDEN	WEST GADSDEN HIGH SCHOOL	F	F	74	CORRECT II	F	No Change	85	+11	CORRECT II	+8	+7	+1	-5	+2	-3
2	DUVAL	ANDREW JACKSON HIGH SCHOOL	F	F	49	CORRECT II	F	No Change	59	+10	INTERVENE	-6	-4	-2	-2	-7	0
2	DUVAL	BILTMORE ELEMENTARY SCHOOL	F	F	77	CORRECT II	C	+ 2 Letter Grades	92	+15	CORRECT I	-1	+25	+17	-11	+32	+27
2	DUVAL	EDWARD H. WHITE HIGH SCHOOL	F	F	69	CORRECT II	D	+ 1 Letter Grade	51	-18	CORRECT II	-2	+1	-5	+7	-1	+2
2	DUVAL	GEORGE WASHINGTON CARVER ELEMENTARY	F	F	74	CORRECT II	B	+ 3 Letter Grades	87	+13	CORRECT I	-5	+20	+8	+24	+4	+45
2	DUVAL	MARTIN LUTHER KING, JUNIOR ELEMENTARY SCHOOL	F	F	79	CORRECT II	B	+ 3 Letter Grades	79	0	CORRECT II	+12	+15	+27	+4	+15	+10
2	DUVAL	NATHAN B. FORREST HIGH SCHOOL	F	F	64	CORRECT II	D	+ 1 Letter Grade	54	-10	CORRECT II	-4	-3	+6	+4	-5	+9
2	DUVAL	WAYMAN ACADEMY OF THE ARTS	F	F	82	CORRECT II	C	+ 2 Letter Grades	90	+8	CORRECT I	-16	+6	+37	+46	0	+3
2	DUVAL	WILLIAM M. RAINES HIGH SCHOOL	F	F	67	CORRECT II	F	No Change	72	+5	INTERVENE	+2	+4	-2	-7	+5	+5
2	PUTNAM	WILLIAM D. MOSELEY ELEMENTARY SCHOOL	F	F	72	CORRECT II	A	+ 4 Letter Grades	100	+28	N/A	+18	+8	+4	+7	+20	+28

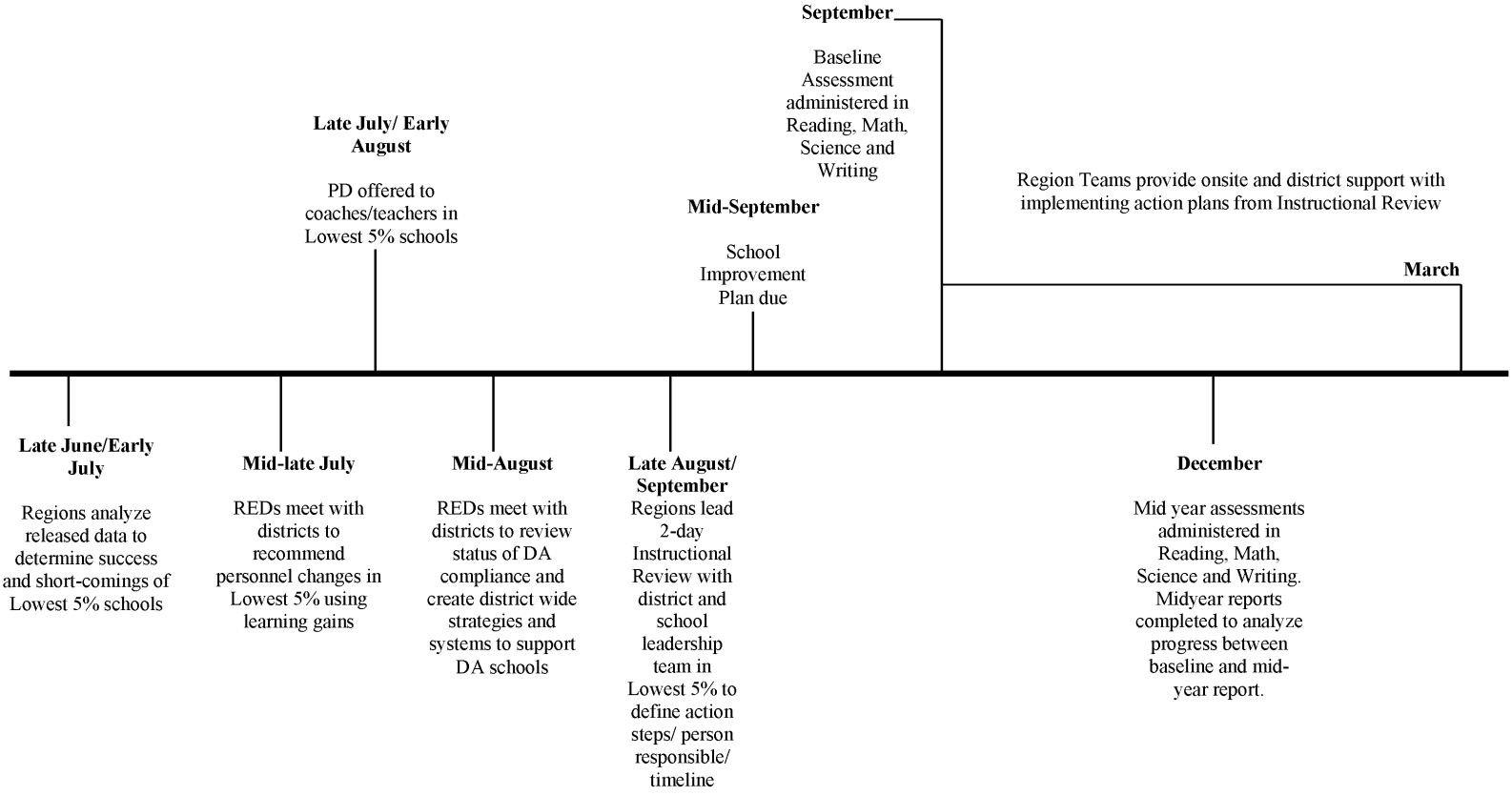
REGION	DISTRICT	SCHOOL	TARGETED STATUS	2008 School Grade	2008 AYP Criteria Met	2008 DA Category	2009 School Grade	Change in School Grade	2009 AYP Criteria Met	Change in AYP % Points	2009 DA Category	Reading +/- meeting high standards	Math +/- meeting high standards	Writing +/- meeting high standards	Science +/- meeting high standards	Reading +/- making learning gains	Math +/- making learning gains
3	ORANGE	MOLLIE E RAY ELEMENTARY SCHOOL	INTERVENE	F	69	INTERVENE	A	+ 4 Letter Grades	100	+31	CORRECT I	+23	+30	+29	+12	+16	+14
3	ORANGE	EXCEL- MIDDLE SCHOOL PROFESSIONAL ACADEMY	F	F	79	CORRECT II	F	No Change	79	0	CORRECT II	-7	-5	-4	0	-2	-18
3	ST. LUCIE	GARDEN CITY ELEMENTARY SCHOOL	F	F	74	CORRECT II	Closed	-	-	-	-	-	-	-	-	-	
4	HILLSBOROUGH	FRANKLIN MIDDLE MAGNET SCHOOL	INTERVENE	D	72	INTERVENE	C	+ 1 Letter Grade	74	+2	INTERVENE	-1	+5	+6	-7	+4	+2
4	HILLSBOROUGH	MIDDLETON HIGH SCHOOL	INTERVENE	D	69	INTERVENE	D	No Change	64	-5	INTERVENE	-1	-1	-2	-4	+2	+3
4	HILLSBOROUGH	SULPHUR SPRINGS ELEMENTARY SCHOOL	INTERVENE	F	69	INTERVENE	B	+ 3 Letter Grades	100	+31	CORRECT I	+13	+23	+20	+27	+17	+23
4	HILLSBOROUGH	BROWARD ELEMENTARY SCHOOL	F	F	69	CORRECT II	C	+ 2 Letter Grades	82	+13	CORRECT I	+1	+2	+35	-13	+11	+18
4	COLLIER	GOLDEN GATE HIGH SCHOOL	F	F	62	CORRECT II	C	+ 2 Letter Grades	85	+23	CORRECT I	+8	+13	+8	-8	+8	+8
4	COLLIER	IMMOKALEE COMMUNITY SCHOOL	F	F	82	CORRECT II	C	+ 2 Letter Grades	85	+3	CORRECT I	-9	+4	+63	+2	+2	+4
4	COLLIER	IMMOKALEE HIGH SCHOOL	F	F	64	CORRECT II	D	+ 1 Letter Grade	69	+5	CORRECT II	+2	+4	-2	-4	-2	+1
5	BROWARD	LARKDALE ELEMENTARY SCHOOL	INTERVENE	D	74	INTERVENE	C	+ 1 Letter Grade	92	+18	INTERVENE	+8	+13	+31	-5	0	+18
5	DADE	HOLMES ELEMENTARY SCHOOL	INTERVENE	F	77	INTERVENE	C	+ 2 Letter Grades	82	+5	INTERVENE	+10	+13	-22	-5	+21	+32
5	DADE	LIBERTY CITY ELEMENTARY SCHOOL	INTERVENE	F	79	INTERVENE	A	+ 4 Letter Grades	100	+21	CORRECT I	+17	+22	+14	-14	+19	+48
5	DADE	MIAMI CENTRAL SENIOR HIGH SCHOOL	INTERVENE	F	54	INTERVENE	D	+ 1 Letter Grade	85	+31	INTERVENE	+4	+13	+10	+7	+1	+5
5	DADE	MIAMI EDISON SENIOR HIGH SCHOOL	INTERVENE	F	77	INTERVENE	F	No Change	74	-3	INTERVENE	-2	-3	-21	+2	+10	-7

REGION	DISTRICT	SCHOOL	TARGETED STATUS	2008 School Grade	2008 AYP Criteria Met	2008 DA Category	2009 School Grade	Change in School Grade	2009 AYP Criteria Met	Change in AYP % Points	2009 DA Category	Reading +/- meeting high standards	Math +/- meeting high standards	Writing +/- meeting high standards	Science +/- meeting high standards	Reading +/- making learning gains	Math +/- making learning gains
5	PALM BEACH	JOHN F. KENNEDY MIDDLE SCHOOL	INTERVENE	D	77	INTERVENE	C	+ 1 Letter Grade	90	+13	CORRECT I	+7	+10	+1	0	+14	+7
5	BROWARD	COCONUT CREEK HIGH SCHOOL	F	F	62	CORRECT II	D	+ 1 Letter Grade	64	+2	CORRECT II	-4	-1	+13	-8	+1	-2
5	BROWARD	IMAGINE CHARTER/N LAUDERDALE	F	F	82	CORRECT II	D	+ 1 Letter Grade	85	+3	CORRECT II	+5	-4	-6	-12	+21	-4
5	BROWARD	SUNLAND PARK ELEMENTARY SCHOOL	F	F	79	CORRECT II	F	No Change	82	+3	CORRECT II	-3	+4	+2	-7	-5	-1
5	BROWARD	SUSIE DANIELS CHARTER SCHOOL	F	F	79	PREVENT II	F	No Change	82	+3	CORRECT II	-2	-11	+3	+4	+17	-16
5	DADE	HOMESTEAD SENIOR HIGH SCHOOL	F	F	62	CORRECT II	D	+ 1 Letter Grade	56	-6	CORRECT II	+4	+7	+2	+4	-1	+1
5	DADE	MIAMI CAROL CITY SENIOR HIGH	F	F	59	CORRECT II	D	+ 1 Letter Grade	79	+20	CORRECT II	0	+11	+11	+4	0	+5
5	DADE	MIAMI COMMUNITY CHARTER SCHOOL	F	F	74	PREVENT II	A	+ 4 Letter Grades	100	+26	PREVENT I	+23	+34	+11	-9	+28	+35
5	DADE	MIAMI NORLAND SENIOR HIGH SCHOOL	F	F	74	CORRECT II	D	+ 1 Letter Grade	74	0	CORRECT II	+4	+8	-7	+3	+3	+6
5	DADE	NORTH MIAMI SENIOR HIGH SCHOOL	F	F	62	CORRECT II	D	+ 1 Letter Grade	69	+7	CORRECT II	+4	+11	-3	-1	+6	+11
5	PALM BEACH	GLADES CENTRAL HIGH SCHOOL	F	F	67	CORRECT II	D	+ 1 Letter Grade	79	+12	CORRECT II	+4	+9	-4	0	+1	-1

E-9: RTTT PERSISTENTLY LOWEST-ACHIEVING SCHOOLS TIMELINE



E-10: Annual DA Regional Team Support Timeline



E-11 - Regional Executive Director Job Description

Application Deadline:
Salary Range: Negotiable
Contact: Deputy Chancellor for School Improvement and Student Achievement
Phone: 850-245-0422
Fax: 850-245-0803
Job Description: See below for qualifications information.
Open Position:

All applicants must submit a letter of interest, qualifications document, and a resume indicating qualifications as they SPECIFICALLY RELATE to the listed criteria for this position via email or fax. You must indicate in your letter if you are claiming Veterans' Preference. It is the responsibility of the applicant to submit sufficient information to enable the screening committee to effectively evaluate his/her education, training, and experience.

QUALIFICATIONS

1. Master's degree (from an accredited institution)
2. Certification in educational leadership or administration and supervision
3. Three (3) years of education leadership, management, and supervision leading successful school improvement/reform efforts in a demographically diverse public school and/or district
4. Demonstrated success working as a change agent with a record of turning around low-performing, high-poverty schools as a principal and/or district administrator

KNOWLEDGE, SKILLS AND ABILITIES

- Keen expertise and experience in the turnaround process as it pertains to low-performing schools
- Deep understanding of what quality teaching and learning "looks like" in the classroom
- Knowledge of lesson study and Response to Intervention (RtI) process and experience with implementation
- Ability to identify strategies and develop systems to improve classroom instruction at the district and school level
- Ability to supervise and coordinate efforts of employees to reach Florida Department of Education (FDOE) program and agency goals
- Ability to coordinate program activities with other department priorities and delegate work assignments as needed
- Ability to develop monitoring systems with district and school leadership teams
- Knowledge of Sunshine State Standards
- Ability to use and analyze data to determine instructional needs and direct academic intervention.
- Assist with developing master schedules to support student achievement
- Ability to monitor budgets and use funds to improve student achievement
- Knowledge of various evidence-based instructional coaching approaches
- Knowledge of how to evaluate and shape district and school cultures

- Ability to coach superintendents and principals in successful turnaround
- Strong interpersonal skills that lead to an effective working relationship with all stakeholders
- Strong written and verbal communication skills
- Strong presentation skills with the ability to deliver technical assistance in a form understood by customers and stakeholders
- Strong organizational and problem-solving skills
- Ability to work autonomously
- Demonstrated skill in ensuring accountability for all stakeholders in the school reform effort
- Strong analytic and interpretation skills
- Ability to orchestrate change
- Ability to meet tight timeframes and balance multiple, competing priorities while maintaining goal directed behavior/performance
- In-depth knowledge of state and federal laws, rules, policies, and procedures related to school improvement and Differentiated Accountability
- Strong knowledge of Microsoft Office programs (Word, Excel, PowerPoint)
- Strong work ethic
- Deep belief and passion that all students can succeed academically if provided the right learning environment

An additional requirement of the job is to be able to travel both in and out of state at least 25-50% of the time for state and federal meetings, workshops/conferences, and site related monitoring and instructional reviews.

REPORTS TO:

Deputy Chancellor for School Improvement and Student Achievement

JOB GOAL:

Provide leadership of the Differentiated Accountability Plan for schools and districts in the region. The position will work directly with district and school leadership and staff in their assigned regions; assure and monitor compliance with state and federal requirements; and provide overall assistance, coordination, and direction to senior administration to improve student achievement in the state's lowest performing districts.

SUPERVISES:

Regional Instructional Specialists and Reading Coordinators

PERFORMANCE RESPONSIBILITIES:

- Manifests a professional code of ethics and values
- Promote, support, and determine DA compliance for districts and schools
- Provide a non-threatening, open, professional and collaborative work relationship and

leadership oversight between the Department, school district(s), and schools categorized in the DA Plan for the purpose of school improvement and implementation of DA for academic accountability
• Assist districts in building capacity to critically assess and selectively incorporate evidence-based strategies to support school improvement by coordinating meetings, regional trainings, and professional development for identified schools within the region
• Provide overall coordination, progress monitoring, and direction to all the instructional specialists, including the use of and constructing protocols for district/school faculty and leadership team development
• Provide leadership for the regional team (comprised of internal and external customers and local stakeholders) in their efforts to assist school districts and schools with their systemic reform and accountability efforts
• Provide technical assistance and coaching to schools, School Advisory Councils, Community Assessment Teams, district offices, and school boards
• Provide assistance with organizational change; Florida Continuous Improvement Model (FCIM), lesson study, program and instructional monitoring, RtI, and the teaching of standards/benchmarks.
• Work collaboratively with districts in the development, implementation, monitoring, and evaluation of plans required by the State Board of Education (SBE)
• Conduct instructional reviews, review school assessment trend data, School Improvement Plan (SIP), and District Improvement Plan (DIP)
• Continually analyze student performance data to drive school improvement strategies
• Prepare detailed policy and data analysis, reports, and evaluations on the status of DA for the Commissioner and State Board of Education
• Responsible for maintaining timely and accurate information and accountable for the quality of information maintained by DA Regional Teams
• Participate in weekly conference calls and bi-monthly meetings in Tallahassee
• Supervise and guide the work of the DA Regional Team
• Perform other duties and responsibilities as assigned by supervisor

TERMS OF EMPLOYMENT:

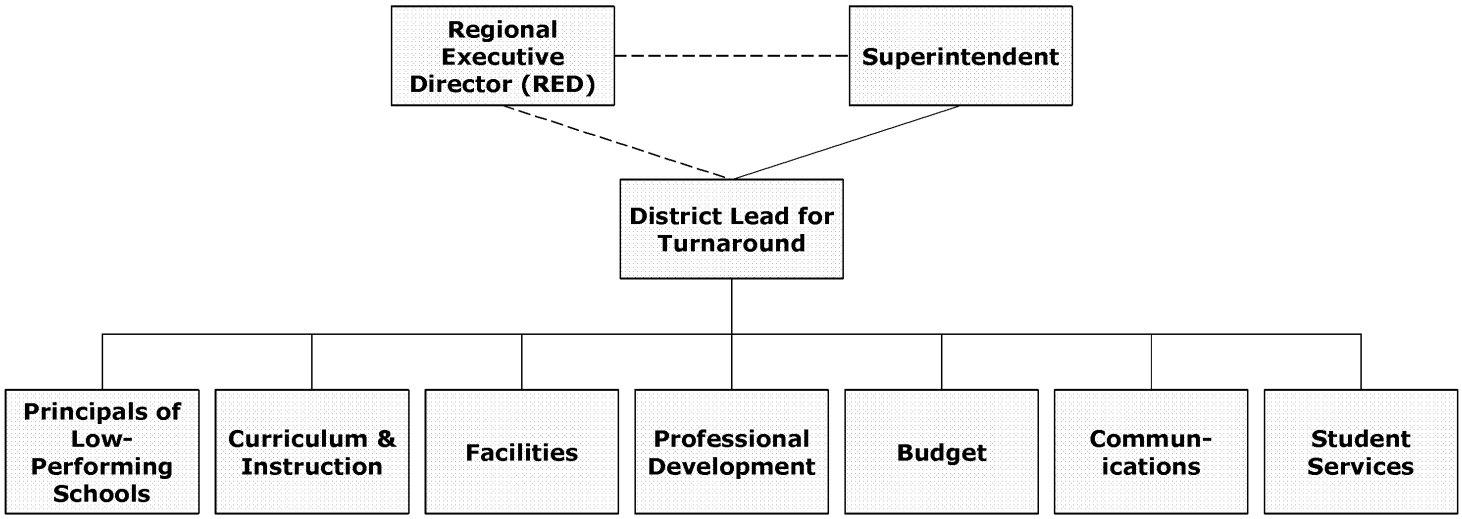
Non-bargaining unit compensation plan, twelve months, 8.0 hours per day

EVALUATION:

Performance of this job will be evaluated in accordance with provisions of the Florida Department of Education's policy on evaluation of personnel. Student achievement must be demonstrated in the state's lowest-performing schools that are assigned to the DA Regional Executive Director.

E-12: District Turnaround for the Lowest-Achieving Schools

Organizational Chart



E-13 - Intervene and Correct II F High Schools to Receive CTE Expansion RTTT Funds

Region	District Name	School Number	School Name	2009 School Grade	2009 AYP Criteria Met	2009 DA Category	2009 Targeted Status
1	JEFFERSON	0021	JEFFERSON COUNTY MIDDLE/HIGH SCHOOL	F	72	INTERVENE	Intervene
2	DUVAL	0351	ANDREW JACKSON HIGH SCHOOL	F	59	INTERVENE	Intervene
2	DUVAL	0961	JEAN RIBAULT HIGH SCHOOL	F	69	INTERVENE	Intervene
2	DUVAL	1651	WILLIAM M. RAINES HIGH SCHOOL	F	72	INTERVENE	Intervene
4	HILLSBOROUGH	3004	MIDDLETON HIGH SCHOOL	D	64	INTERVENE	Implement Intervene
5	DADE	7301	MIAMI EDISON SENIOR HIGH SCHOOL	F	74	INTERVENE	Implement Intervene
5	DADE	7251	MIAMI CENTRAL SENIOR HIGH SCHOOL	D	85	INTERVENE	Transitional Intervene
5	PALM BEACH	0691	LAKE WORTH HIGH SCHOOL	D	64	INTERVENE	Intervene
1	GADSDEN	0071	EAST GADSDEN HIGH SCHOOL	F	79	CORRECT II	F
1	GADSDEN	0051	WEST GADSDEN HIGH SCHOOL	F	85	CORRECT II	F
1	LEON	0161	AMOS P. GODBY HIGH SCHOOL	F	77	CORRECT II	F
1	MADISON	0011	MADISON COUNTY HIGH SCHOOL	F	72	CORRECT II	F
2	DUVAL	2851	A. PHILIP RANDOLPH ACADEMIES	F	64	CORRECT II	F
2	DUVAL	2651	FIRST COAST HIGH SCHOOL	F	46	CORRECT II	F
2	HAMILTON	0032	HAMILTON COUNTY HIGH SCHOOL	F	67	CORRECT II	F
2	LEVY	0091	WILLISTON HIGH SCHOOL	F	69	CORRECT II	F
2	ST. JOHNS	0033	ST. JOHNS TECHNICAL HIGH SCHOOL	F	72	CORRECT II	F
3	OSCEOLA	0841	POINCIANA HIGH SCHOOL	F	59	CORRECT II	F
4	HENDRY	0201	CLEWISTON HIGH SCHOOL	F	67	CORRECT II	F
4	PINELLAS	1531	GIBBS HIGH SCHOOL	F	69	CORRECT II	F
5	DADE	7791	BOOKER T. WASHINGTON SENIOR HIGH	F	69	CORRECT II	F
5	DADE	7341	MIAMI JACKSON SENIOR HIGH SCHOOL	F	67	CORRECT II	F
5	DADE	7411	MIAMI NORTHWESTERN SENIOR HIGH	F	74	CORRECT II	F
5	DADE	7731	MIAMI SOUTHRIDGE SENIOR HIGH	F	64	CORRECT II	F

E-14 - Model Full-Day Prekindergarten Programs

Florida Department of Education

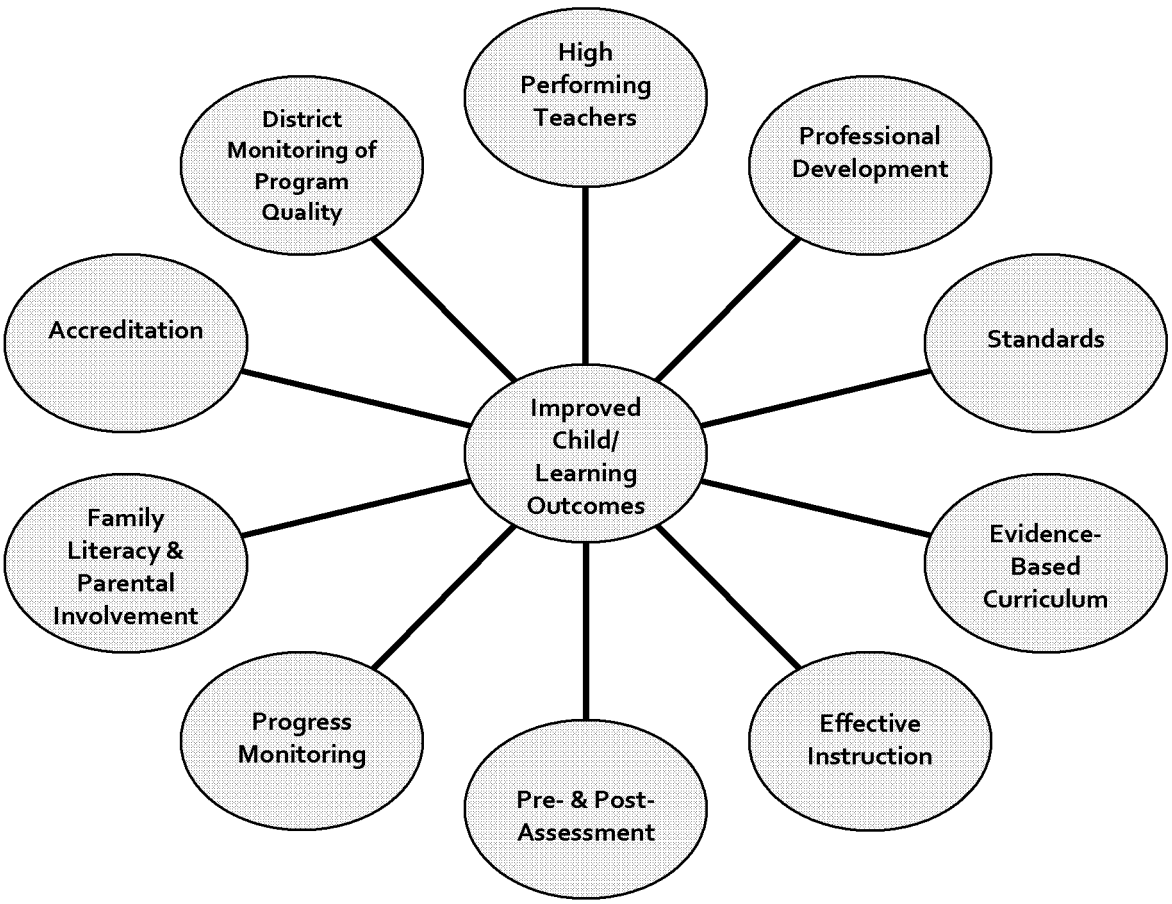
Background Information

Through the work that began in 1999 with the implementation of key statewide initiatives that focused on early, high quality instruction and intervention, Florida has made substantial progress in meeting its goal that all children should be performing at or above grade level in reading and mathematics by the end of third grade on Florida's Comprehensive Achievement Test (FCAT). However, for Florida to meet its goal of 100% proficiency in reading and mathematics by the end of third grade, it must be acknowledged that for some children, an achievement gap exists upon their entry to school. Therefore, Florida must strengthen its foundational programs in reading and mathematics beginning with prekindergarten.

Goal

To provide four-year-olds who are at risk of future school failure with high-quality full-day prekindergarten programs

Components of a Model Prekindergarten Program



High Performing Teachers

High performing teachers must be able to:

- recognize and deliver developmentally appropriate effective instruction
- develop partnerships with families
- use data to inform instruction.

Professional Development

Teachers must participate in appropriate professional development that includes the following areas:

- VPK Education Standards training
- Emergent Literacy for VPK Instructors
- strategies to maximize instructional time through effective classroom management
- support the implementation of the selected curriculum with fidelity
- use of selected assessments and the data.

Standards

The VPK Education Standards are to be used as the basis for instruction. Curriculum, instruction and any assessments must be aligned with these standards.

Evidenced-Based Curriculum

The curriculum used must:

- have primary or secondary research that supports its effectiveness (primary research are studies to support the use of the specific curriculum in reading and/or math; secondary research is empirical research that supports the use of specific instructional practices that are included in the curriculum)
- be aligned with the VPK Standards and with the district's elementary reading and math curricula
- be developmentally appropriate
- include supplemental materials designed to meet the targeted needs of the children.

Pre- & Post- Assessment

Pre-and post-assessment results must:

- be aligned with the VPK Education Standards
- provide information on targeted entry and exit skills during the prekindergarten program.

On-going Progress Monitoring

On-going progress monitoring measures must:

- be aligned with the VPK Education Standards
- be administered multiple times throughout the program
- provide data to inform instructional focus and strategies for use by the classroom teacher.

Family Literacy and Parental Involvement

Parent involvement must be:

- designed to help parents reinforce classroom instruction
- regularly scheduled at times convenient for parents.

Improved Student Outcomes

Implementation the above components should result in improved child outcomes, such as:

- high performance on post-assessments
- high performance on kindergarten screening
- continue to accelerate rate of learning or learning gains (e.g., results of progress monitoring measures)
- increased academic engagement.

District Monitoring of Program Quality

Districts must develop a system to periodically review/observe classrooms to ensure that the core components of the model program are in place (e.g., principal walk-through, peer-to-peer monitoring).

Accreditation

Programs should aspire to become accredited by either a state or nationally recognized accrediting association (e.g., Southern Associate of Colleges and Schools (SACS), National Association for the Education of Young Children guidelines, National Early Childhood Program Accreditation Commission).

E-15: Section (E) Initiative Summary Chart

Federal Requirement	Initiative Outcome	Implementation Timeline	Total Budget
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Extend Support to all Schools in the Persistently Lowest-Achieving 5% • Expand direct support provided by the DA Regional Teams to include all schools identified within the persistently lowest-achieving 5%.	• Year 1: Districts/schools will select and implement turnaround option and receive SIG funds to fund implementation. DA Regional Teams will assist in implementation and monitor progress. At the end of the school year, school performance analyzed to determine effectiveness of implemented option. • Year 2: Continue implementation of option if effective. At the end of the school year, school performance analyzed to determine effectiveness of option. • Year 3: Continue implementation of option if effective. At the end of the school year, school performance analyzed to determine effectiveness of option. • Year 4: Continue implementation of option if effective. At the end of the school year, school performance analyzed to determine effectiveness of option.	DA Teams already in place. No additional cost required for this initiative.
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Teacher Recruitment • Expand the recruitment and placement of promising teachers within the state's two districts (Miami-Dade and Duval) with the greatest number of schools in the persistently lowest-achieving 5% through external partnerships.	• Year 1: FDOE to release RFP. Partner selected. Teachers recruited and trained. School placement is determined. • Year 2: Teachers report to assigned school. Teacher effectiveness data to be tracked to determine success of organization. • Year 3: Teachers report to assigned school. Teacher effectiveness data to be tracked to determine success of organization. • Year 4: Teachers report to assigned school. Teacher effectiveness data to be tracked to determine success of organization. .	$14,400,000
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Leadership Pipeline for Turnaround Principals and Assistant Principals • Develop a statewide pool of aspiring principals and assistant principals who have the knowledge and leadership skills to be effective in turning around struggling schools. Placement of these administrators will be in Florida's persistently lowest-achieving 5% of schools	• Year 1: FDOE to release RFP. Partner selected. Candidates selected for training. Partnerships established with universities. • Year 2: Candidates begin training modules. • Year 3: Candidates continue training modules. • Year 4: Candidates begin internship component of training module. Placed in persistently lowest-achieving 5% of schools and their feeder patterns.	$8,704,674
(E)(2)(ii) – Support LEAs in turning around	• State-Led: Building District-Level Capacity for Turnaround in Rural Districts • Build district-level capacity, particularly in small, rural school	• Year 1: FDOE to release RFP. Partner selected. FDOE will invite selected districts to participate. Districts begin training modules. • Year 2: Districts continue training modules. • Year 3: Districts complete training modules. • Year 4: N/A	$1,719,384

Federal Requirement	Initiative Outcome	Implementation Timeline	Total Budget
schools	districts, to project manage, analyze data, strategically plan, and conduct school reform to improve student achievement in schools in the persistently lowest-achieving 5%.		
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Differentiated Accountability Summer Academy • Improve the quality of instruction by providing systematic and intensive professional development during a summer DA academy that focuses on teacher effectiveness and topics that are consistently identified as concerns in the state's persistently lowest-achieving 5% of schools and their feeder patterns.	• Year 1: DA Regional Teams to identify location of training and select participants. Training conducted. • Year 2: DA Regional Teams to identify location of training and select participants. Training conducted. • Year 3: DA Regional Teams to identify location of training and select participants. Training conducted. • Year 4: DA Regional Teams to identify location of training and select participants. Training conducted.	$8,008,000
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Charter School Partnership • Partner with national charter school funding organization(s) to increase the number of charter school options serving high-need neighborhoods by opening 30–40 new high quality charter schools in those neighborhoods, with 25-30 of those schools opening within the feeder patterns of the persistently lowest-achieving 5% of schools.	• Year 1: Identify and recruit most-effective charter operators to establish schools in feeder patterns of the persistently lowest-achieving 5% of schools • Year 2: Continue expansion of charter schools in feeder patterns of the persistently lowest-achieving 5% of schools • Year 3: Continue expansion of charter schools in feeder patterns of the persistently lowest-achieving 5% of schools • Year 4: Continue expansion of charter schools in feeder patterns of the persistently lowest-achieving 5% of schools	$30,000,000
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Improve and Expand STEM Career and Professional Academies • FDOE to provide funds to expand high quality Career and Technical Education programs (namely STEM) as well as the expansion	• Year 1: FDOE, along with districts/schools, will review current CTE programs in high schools within the persistently lowest-achieving 5% and determine how to expand offerings to include STEM programs. Curriculum, equipment, and appropriate staff to be selected. Staff to be trained. • Year 2: Districts/schools implement new CTE program. Data to be tracked to monitor success of program. DA Regional Team to assist with implementation. • Year 3: Districts/schools implement new CTE program. Data to be tracked to	$10,046,000

Federal Requirement	Initiative Outcome	Implementation Timeline	Total Budget
	and/or establishment of Career and CAPE Academies to assist in the preparation of student for college and the workforce by linking academic skills to career training. Funding will be provided to the twenty-four lowest-performing high schools in the persistently lowest-achieving 5%.	monitor success of program. DA Regional Team to assist with implementation. • Year 4: Districts/schools implement new CTE program. Data to be tracked to monitor success of program. DA Regional Team to assist with implementation.	
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Reading Coordinators • Provide a sufficient number of reading coordinators to each DA Regional Team to ensure ongoing support and coaching of school and district staff to improve the quality of reading instruction in schools within the persistently lowest-achieving 5% and their feeder patterns.	• Year 1: DA Regional Executive Director will recruit, hire, and place coordinators in selected schools within the persistently lowest-achieving 5% and their feeder patterns. Data to be tracked to ensure effectiveness of coordinator after placement. • Year 2: Coordinators continue serving persistently lowest-achieving 5% of schools and their feeder patterns. Data to be tracked to ensure effectiveness of coordinator after placement. • Year 3: Coordinators continue serving persistently lowest-achieving 5% of schools and their feeder patterns. Data to be tracked to ensure effectiveness of coordinator after placement. • Year 4: Coordinators continue serving persistently lowest-achieving 5% of schools and their feeder patterns. Data to be tracked to ensure effectiveness of coordinator after placement.	$14,396,000
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Science, Technology, Engineering, and Mathematics (STEM) Coordinators • Provide a sufficient number of STEM coordinators to each DA Regional Team to ensure ongoing support and coaching of school and district staff to strengthen STEM initiatives within schools in the persistently lowest-achieving 5% and their feeder patterns.	• Year 1: DA Regional Executive Director will recruit, hire, and place coordinators in selected schools within the persistently lowest-achieving 5% and their feeder patterns. Data to be tracked to ensure effectiveness of coordinator after placement. • Year 2: Coordinators continue serving persistently lowest-achieving 5% of schools and their feeder patterns. Data to be tracked to ensure effectiveness of coordinator after placement. • Year 3: Coordinators continue serving persistently lowest-achieving 5% of schools and their feeder patterns. Data to be tracked to ensure effectiveness of coordinator after placement. • Year 4: Coordinators continue serving persistently lowest-achieving 5% of schools and their feeder patterns. Data to be tracked to ensure effectiveness of coordinator after placement.	$14,396,000

Federal Requirement	Initiative Outcome	Implementation Timeline	Total Budget
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Community Compact • Provide a competitive process for districts with the lowest performing high schools (Intervene) to enter into a compact with communities and local businesses to provide parents with family literacy programs and a parent academy along with mentors, tutors, and volunteers for at-risk students	• Year 1: FDOE to select three districts to implement RFP. Districts plan for compact implementation. FDOE to select four CBOs to expand mentorship opportunities statewide. • Year 2: Districts and CBOs implement activities of compact. Data tracked to ensure compact goals are reached. • Year 3: Districts and CBOs implement activities of compact. Data tracked to ensure compact goals are reached. • Year 4: Districts and CBOs implement activities of compact. Data tracked to ensure compact goals are reached.	$68,000,000
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Public Awareness Campaign to Promote a College Readiness Culture • Expand public awareness campaign to promote a college readiness culture in neighborhoods that have the majority of the state's persistently lowest-achieving 5% of schools.	• Year 1: FDOE to release RFP and select a partner for public awareness campaign. • Year 2: Continue to implement campaign activities • Year 3: Continue to implement campaign activities	$2,864,906
(E)(2)(ii) – Support LEAs in turning around schools	• State -Led: Algebra Inventive Bonus to Develop STEM Skills • Increase attention to mathematics instruction for middle grades by offering a financial incentive to the school for each middle grades student who successfully completes an end of year exam for Algebra 1 in the persistently lowest-achieving 5% of schools.	• Year 1: Promote opportunity to participate in incentive program to increase the number of students who pass the Algebra I end of course exam in the middle schools that feed high schools in the persistently lowest-achieving 5% • Year 2: Promote opportunity to participate in incentive program to increase the number of students who pass the Algebra I end of course exam in the middle schools that feed high schools in the persistently lowest-achieving 5% • Year 3: Track data to determine how many students pass the Algebra I end of course exam and provide bonus to qualifying participants. • Year 4: Track data to determine how many students pass the Algebra I end of course exam and provide bonus to qualifying participants.	$7,077,078
(E)(2)(ii) – Support LEAs in turning around schools	• State-Led: Cultural Competency • Train leadership teams for high schools within the persistently lowest-achieving 5% as well as the five DA Regional Teams in high quality Cultural Competency training.	• Year 1: FDOE to release RFP. Partner selected. DA Regional Teams and leadership teams of high schools in persistently lowest-achieving 5% will be provided training. • Year 2: N/A • Year 3: N/A • Year 4: N/A	$856,170
(E)(2)(ii) –	• District-Led: Extended learning	• Year 1: Districts/schools will identify curriculum to be used during extended	Estimated cost 1K per

Federal Requirement	Initiative Outcome	Implementation Timeline	Total Budget
Support LEAs in turning around schools	time in Intervene Schools • Increase instructional time for students below grade level in the state's lowest-performing high schools (Intervene) that are also in the state's persistently lowest-achieving 5% of schools. • 300 hours of instructional time is added to the school year.	day/year and select most effective teachers to deliver instruction. All teachers trained in curriculum and lesson study process. • Year 2: Districts/schools to implement extended day/year. Continuously review formative and interim assessment data to redirect instruction and intervention. • Year 3: Districts/schools to implement extended day/year. Continuously review formative and interim assessment data to redirect instruction and intervention. • Year 4: Districts/schools to implement extended day/year. Continuously review formative and interim assessment data to redirect instruction and intervention.	student. Cost depends on curriculum selected and size of student population.
(E)(2)(ii) – Support LEAs in turning around schools	• District-Led: Expand Full-day Prekindergarten • Provide four-year-olds who are at risk for future school failure with high-quality full-day prekindergarten programs within the feeder patterns of high schools in the persistently lowest-achieving 5%.	• Year 1: Districts/schools will review current placement of Pre-K programs and identify what elementary schools will introduce new programs. Curriculum and staff to be selected and training provided on implementation. • Year 2: Districts/schools implement new Pre-K program. Data to be tracked to determine increase of school readiness skills of participating students. • Year 3: Districts/schools implement new Pre-K program. Data to be tracked to determine increase of school readiness skills of participating students. • Year 4: Districts/schools implement new Pre-K program. Data to be tracked to determine increase of school readiness skills of participating students.	Costs are dependent on how districts use RTTT, SIG, and Title I (A) funding and the extent of implementation.
(E)(2)(ii) – Support LEAs in turning around schools	• District-Led: Expand career and professional academies • Expand high quality Career and Technical Education programs (namely STEM) as well as the expansion and/or establishment of Career and CAPE academies to assist in the preparation of student for college and the workforce by linking academic skills to career training. A special emphasis will be placed on schools in the persistently lowest-achieving 5%.	• Year 1: Districts/schools will review current CTE programs in high schools within the lowest 5% and determine how to expand offerings to include STEM programs. Curriculum, equipment, and appropriate staff to be selected. Staff to be trained. • Year 2: Districts/schools implement new CTE program. Data to be tracked to monitor success of program. • Year 3: Districts/schools implement new CTE program. Data to be tracked to monitor success of program. • Year 4: Districts/schools implement new CTE program. Data to be tracked to monitor success of program.	Costs are dependent on how districts use RTTT, SIG, and Title I (A) funding and the extent of implementation.

Federal Requirement	Initiative Outcome	Implementation Timeline	Total Budget
(E)(2)(ii) – Support LEAs in turning around schools	• District-Led: Evidence-based and Proven Programs to Support At-Risk Students • Support the initial, continued, and expanded implementation of programs and strategies within the persistently lowest-achieving 5% of schools and their feeder patterns to support dropout prevention, encourage advanced classes, positive behavior support systems, mentoring, and curriculum that provide high-need students with college and career-ready skills. A focus will be placed on students returning from DJJ facilities.	• Year 1: Districts/schools will review current program offerings and expand or select additional ones. • Year 2: Districts/schools implement or expand additional ones. Data to be tracked to monitor success of programs. • Year 3: Districts/schools implement or expand additional ones. Data to be tracked to monitor success of programs. • Year 4: Districts/schools implement or expand additional ones. Data to be tracked to monitor success of programs.	Costs are dependent on how districts allocate available funds.

Florida Department of Education
F-1a - 2008-09 State and Local FEFP Funds, Unranked
2008-09 FEFP Fourth Calculation
State and Local Funding Summary By District

District	Total State and Local Funding -1-	Total State Funding -2-	% -3-	Total Local Funding -4-	% -5-
1 Alachua	183,376,848	105,679,763	57.63%	77,697,085	42.37%
2 Baker	33,226,486	28,267,812	85.08%	4,958,674	14.92%
3 Bay	167,642,831	63,434,687	37.84%	104,208,144	62.16%
4 Bradford	23,316,099	18,054,402	77.43%	5,261,697	22.57%
5 Brevard	492,861,236	259,921,109	52.74%	232,940,127	47.26%
6 Broward	1,745,389,260	793,393,440	45.46%	951,995,820	54.54%
7 Calhoun	15,308,355	13,188,659	86.15%	2,119,696	13.85%
8 Charlotte	117,177,959	29,816,469	25.45%	87,361,490	74.55%
9 Citrus	106,793,611	42,018,878	39.35%	64,774,733	60.65%
10 Clay	241,834,293	180,005,368	74.43%	61,828,925	25.57%
11 Collier	322,198,188	80,093,108	24.86%	242,105,080	75.14%
12 Columbia	67,609,784	51,669,364	76.42%	15,940,420	23.58%
13 Miami-Dade	2,336,892,925	918,680,955	39.31%	1,418,211,970	60.69%
14 DeSoto	34,108,857	23,675,195	69.41%	10,433,662	30.59%
15 Dixie	14,344,384	10,856,501	75.68%	3,487,883	24.32%
16 Duval	853,973,353	492,926,294	57.72%	361,047,059	42.28%
17 Escambia	265,278,799	171,068,186	64.49%	94,210,613	35.51%
18 Flagler	85,996,745	23,153,998	26.92%	62,842,747	73.08%
19 Franklin	9,031,765	2,324,035	25.73%	6,707,730	74.27%
20 Gadsden	40,719,843	32,284,337	79.28%	8,435,506	20.72%
21 Gilchrist	19,540,206	15,368,479	78.65%	4,171,727	21.35%
22 Glades	9,902,590	5,942,410	60.01%	3,960,180	39.99%
23 Gulf	14,138,081	3,456,948	24.45%	10,681,133	75.55%
24 Hamilton	13,071,282	8,744,896	66.90%	4,326,386	33.10%
25 Hardee	33,921,265	24,202,625	71.35%	9,718,640	28.65%
26 Hendry	48,737,667	34,990,882	71.79%	13,746,785	28.21%
27 Hernando	149,274,556	86,205,893	57.75%	63,068,663	42.25%
28 Highlands	81,973,754	44,140,830	53.85%	37,832,924	46.15%
29 Hillsborough	1,309,000,928	797,589,839	60.93%	511,411,089	39.07%
30 Holmes	22,295,070	19,765,721	88.66%	2,529,349	11.34%
31 Indian River	118,436,020	31,194,463	26.34%	87,241,557	73.66%
32 Jackson	47,675,059	39,036,220	81.88%	8,638,839	18.12%
33 Jefferson	8,277,455	4,968,611	60.03%	3,308,844	39.97%
34 Lafayette	7,316,959	5,961,748	81.48%	1,355,211	18.52%
35 Lake	262,668,989	138,099,922	52.58%	124,569,067	47.42%
36 Lee	569,045,147	139,629,593	24.54%	429,415,554	75.46%
37 Leon	220,227,158	126,032,825	57.23%	94,194,333	42.77%
38 Levy	42,014,933	28,212,606	67.15%	13,802,327	32.85%
39 Liberty	10,295,330	8,805,435	85.53%	1,489,895	14.47%
40 Madison	18,423,791	14,157,857	76.85%	4,265,934	23.15%
41 Manatee	286,135,231	109,354,297	38.22%	176,780,934	61.78%
42 Marion	276,044,087	154,148,566	55.84%	121,895,521	44.16%
43 Martin	125,228,996	33,295,686	26.59%	91,933,310	73.41%
44 Monroe	63,614,387	14,835,408	23.32%	48,778,979	76.68%
45 Nassau	75,267,833	27,081,162	35.98%	48,186,671	64.02%
46 Okaloosa	193,996,917	90,173,651	46.48%	103,823,266	53.52%
47 Okeechobee	46,665,322	33,518,843	71.83%	13,146,479	28.17%
48 Orange	1,164,763,659	561,095,472	48.17%	603,668,187	51.83%
49 Osceola	341,307,482	192,501,071	56.40%	148,806,411	43.60%
50 Palm Beach	1,191,545,935	310,961,552	26.10%	880,584,383	73.90%
51 Pasco	453,359,737	293,784,193	64.80%	159,575,544	35.20%
52 Pinellas	725,801,361	293,710,115	40.47%	432,091,246	59.53%
53 Polk	618,144,163	412,291,633	66.70%	205,852,530	33.30%
54 Putnam	75,393,275	51,035,814	67.69%	24,357,461	32.31%
55 St. Johns	193,424,777	59,629,337	30.83%	133,795,440	69.17%
56 St. Lucie	261,243,705	130,767,157	50.06%	130,476,548	49.94%
57 Santa Rosa	161,009,632	106,040,309	65.86%	54,969,323	34.14%
58 Sarasota	298,934,830	71,281,564	23.85%	227,653,266	76.15%
59 Seminole	428,947,988	240,557,822	56.08%	188,390,166	43.92%
60 Sumter	49,535,940	13,939,669	28.14%	35,596,271	71.86%
61 Suwannee	36,799,586	26,390,042	71.71%	10,409,544	28.29%
62 Taylor	19,693,689	12,308,905	62.50%	7,384,784	37.50%
63 Union	15,251,258	13,855,060	90.85%	1,396,198	9.15%
64 Volusia	418,967,881	203,458,541	48.56%	215,509,340	51.44%
65 Wakulla	34,597,669	25,550,840	73.85%	9,046,829	26.15%
66 Walton	48,330,902	11,396,215	23.58%	36,934,687	76.42%
67 Washington	23,220,038	17,108,993	73.68%	6,111,045	26.32%
68 Washington Special	3,773,247	3,773,247	100.00%	0	0.00%
69 FAMU Lab School	3,163,915	3,163,915	100.00%	0	0.00%
70 FAU- Palm Beach	4,261,028	4,261,028	100.00%	0	0.00%
71 FAU- St.Lucie	8,942,946	8,942,946	100.00%	0	0.00%
72 FSU- Broward	4,502,019	4,502,019	100.00%	0	0.00%
73 FSU- Leon	10,481,259	10,481,259	100.00%	0	0.00%
74 UF Lab School	7,823,622	7,823,622	100.00%	0	0.00%
75 Florida Virtual Sch.	87219654	87219654	100.00%	0	0.00%
State	17,920,711,831	8,557,259,970	47.75%	9,363,451,861	52.25%

Florida Department of Education
F-1a - 2008-09 State and Local FEFP Funds, Ranked
2008-09 FEFP Fourth Calculation
State and Local Funding Summary By District Ranked

District	Total State and Local Funding -1-	Total State Funding -2-	% -3-	Total Local Funding -4-	% -5-
44 Monroe	63,614,387	14,835,408	23.32%	48,778,979	76.68%
66 Walton	48,330,902	11,396,215	23.58%	36,934,687	76.42%
58 Sarasota	298,934,830	71,281,564	23.85%	227,653,266	76.15%
23 Gulf	14,138,081	3,456,948	24.45%	10,681,133	75.55%
36 Lee	569,045,147	139,629,593	24.54%	429,415,554	75.46%
11 Collier	322,198,188	80,093,108	24.86%	242,105,080	75.14%
8 Charlotte	117,177,959	29,816,469	25.45%	87,361,490	74.55%
19 Franklin	9,031,765	2,324,035	25.73%	6,707,730	74.27%
50 Palm Beach	1,191,545,935	310,961,552	26.10%	880,584,383	73.90%
31 Indian River	118,436,020	31,194,463	26.34%	87,241,557	73.66%
43 Martin	125,228,996	33,295,686	26.59%	91,933,310	73.41%
18 Flagler	85,996,745	23,153,998	26.92%	62,842,747	73.08%
60 Sumter	49,535,940	13,939,669	28.14%	35,596,271	71.86%
55 St. Johns	193,424,777	59,629,337	30.83%	133,795,440	69.17%
45 Nassau	75,267,833	27,081,162	35.98%	48,186,671	64.02%
3 Bay	167,642,831	63,434,687	37.84%	104,208,144	62.16%
41 Manatee	286,135,231	109,354,297	38.22%	176,780,934	61.78%
13 Miami-Dade	2,336,892,925	918,680,955	39.31%	1,418,211,970	60.69%
9 Citrus	106,793,611	42,018,878	39.35%	64,774,733	60.65%
52 Pinellas	725,801,361	293,710,115	40.47%	432,091,246	59.53%
6 Broward	1,745,389,260	793,393,440	45.46%	951,995,820	54.54%
46 Okaloosa	193,996,917	90,173,651	46.48%	103,823,266	53.52%
48 Orange	1,164,763,659	561,095,472	48.17%	603,668,187	51.83%
64 Volusia	418,967,881	203,458,541	48.56%	215,509,340	51.44%
56 St. Lucie	261,243,705	130,767,157	50.06%	130,476,548	49.94%
35 Lake	262,668,989	138,099,922	52.58%	124,569,067	47.42%
5 Brevard	492,861,236	259,921,109	52.74%	232,940,127	47.26%
28 Highlands	81,973,754	44,140,830	53.85%	37,832,924	46.15%
42 Marion	276,044,087	154,148,566	55.84%	121,895,521	44.16%
59 Seminole	428,947,988	240,557,822	56.08%	188,390,166	43.92%
49 Osceola	341,307,482	192,501,071	56.40%	148,806,411	43.60%
37 Leon	220,227,158	126,032,825	57.23%	94,194,333	42.77%
1 Alachua	183,376,848	105,679,763	57.63%	77,697,085	42.37%
16 Duval	853,973,353	492,926,294	57.72%	361,047,059	42.28%
27 Hernando	149,274,556	86,205,893	57.75%	63,068,663	42.25%
22 Glades	9,902,590	5,942,410	60.01%	3,960,180	39.99%
33 Jefferson	8,277,455	4,968,611	60.03%	3,308,844	39.97%
29 Hillsborough	1,309,000,928	797,589,839	60.93%	511,411,089	39.07%
62 Taylor	19,693,689	12,308,905	62.50%	7,384,784	37.50%
17 Escambia	265,278,799	171,068,186	64.49%	94,210,613	35.51%
51 Pasco	453,359,737	293,784,193	64.80%	159,575,544	35.20%
57 Santa Rosa	161,009,632	106,040,309	65.86%	54,969,323	34.14%
53 Polk	618,144,163	412,291,633	66.70%	205,852,530	33.30%
24 Hamilton	13,071,282	8,744,896	66.90%	4,326,386	33.10%
38 Levy	42,014,933	28,212,606	67.15%	13,802,327	32.85%
54 Putnam	75,393,275	51,035,814	67.69%	24,357,461	32.31%
14 DeSoto	34,108,857	23,675,195	69.41%	10,433,662	30.59%
25 Hardee	33,921,265	24,202,625	71.35%	9,718,640	28.65%
61 Suwannee	36,799,586	26,390,042	71.71%	10,409,544	28.29%
26 Hendry	48,737,667	34,990,882	71.79%	13,746,785	28.21%
47 Okeechobee	46,665,322	33,518,843	71.83%	13,146,479	28.17%
67 Washington	23,220,038	17,108,993	73.68%	6,111,045	26.32%
65 Wakulla	34,597,669	25,550,840	73.85%	9,046,829	26.15%
10 Clay	241,834,293	180,005,368	74.43%	61,828,925	25.57%
15 Dixie	14,344,384	10,856,501	75.68%	3,487,883	24.32%
12 Columbia	67,609,784	51,669,364	76.42%	15,940,420	23.58%
40 Madison	18,423,791	14,157,857	76.85%	4,265,934	23.15%
4 Bradford	23,316,099	18,054,402	77.43%	5,261,697	22.57%
21 Gilchrist	19,540,206	15,368,479	78.65%	4,171,727	21.35%
20 Gadsden	40,719,843	32,284,337	79.28%	8,435,506	20.72%
34 Lafayette	7,316,959	5,961,748	81.48%	1,355,211	18.52%
32 Jackson	47,675,059	39,036,220	81.88%	8,638,839	18.12%
2 Baker	33,226,486	28,267,812	85.08%	4,958,674	14.92%
39 Liberty	10,295,330	8,805,435	85.53%	1,489,895	14.47%
7 Calhoun	15,308,355	13,188,659	86.15%	2,119,696	13.85%
30 Holmes	22,295,070	19,765,721	88.66%	2,529,349	11.34%
63 Union	15,251,258	13,855,060	90.85%	1,396,198	9.15%
68 Washington Special	3,773,247	3,773,247	100.00%	0	0.00%
69 FAMU Lab School	3,163,915	3,163,915	100.00%	0	0.00%
70 FAU- Palm Beach	4,261,028	4,261,028	100.00%	0	0.00%
71 FAU- St.Lucie	8,942,946	8,942,946	100.00%	0	0.00%
72 FSU- Broward	4,502,019	4,502,019	100.00%	0	0.00%
73 FSU- Leon	10,481,259	10,481,259	100.00%	0	0.00%
74 UF Lab School	7,823,622	7,823,622	100.00%	0	0.00%
75 Florida Virtual Sch.	87219654	87219654	100.00%	0	0.00%
State	17,920,711,831	8,557,259,970	47.75%	9,363,451,861	52.25%

Florida Department of Education

F-1b - 2008-09 State and Local FEFP Funds per student, Unranked

2008-09 FEFP Fourth Calculation

Value of a Mill Per FTE

	District	2008-09 Unweighted FTE	2008 School Taxable Value1	Value of a Mill	Value of a Mill Per FTE
		-1-	-2-	-3-	-4-
1	Alachua	27,293.04	13,713,347,543	13,027,680	477
2	Baker	4,942.29	892,096,547	847,492	171
3	Bay	25,232.05	18,991,132,748	18,041,576	715
4	Bradford	3,235.49	942,103,857	894,999	277
5	Brevard	72,200.50	41,482,005,385	39,407,905	546
6	Broward	254,898.34	176,830,926,919	167,989,381	659
7	Calhoun	2,197.33	382,917,219	363,771	166
8	Charlotte	16,993.43	19,947,822,855	18,950,432	1115
9	Citrus	15,796.00	11,717,465,012	11,131,592	705
10	Clay	35,844.38	11,014,229,027	10,463,518	292
11	Collier	41,986.70	80,673,457,620	76,639,785	1825
12	Columbia	9,990.66	2,810,618,069	2,670,087	267
13	Miami-Dade	342,677.77	258,145,375,277	245,238,107	716
14	DeSoto	4,996.94	1,903,101,906	1,807,947	362
15	Dixie	2,061.53	633,774,565	602,086	292
16	Duval	123,730.29	65,401,744,384	62,131,657	502
17	Escambia	40,335.18	16,435,045,831	15,613,294	387
18	Flagler	12,738.31	11,897,528,655	11,302,652	887
19	Franklin	1,201.15	3,504,102,998	3,328,898	2771
20	Gadsden	5,963.10	1,518,898,504	1,442,954	242
21	Gilchrist	2,643.62	731,272,524	694,709	263
22	Glades	1,403.39	726,618,593	690,288	492
23	Gulf	2,006.61	2,629,396,112	2,497,926	1245
24	Hamilton	1,843.68	764,365,634	726,147	394
25	Hardee	5,153.67	1,696,823,206	1,611,982	313
26	Hendry	7,005.46	2,442,657,068	2,320,524	331
27	Hernando	22,636.28	11,452,141,804	10,879,535	481
28	Highlands	12,239.88	6,707,786,873	6,372,398	521
29	Hillsborough	190,104.56	89,319,306,778	84,853,341	446
30	Holmes	3,342.38	452,493,551	429,869	129
31	Indian River	17,398.58	18,329,983,650	17,413,484	1001
32	Jackson	7,076.13	1,553,119,549	1,475,464	209
33	Jefferson	1,103.62	621,186,733	590,127	535
34	Lafayette	1,088.65	250,357,700	237,840	218
35	Lake	40,151.05	22,737,182,842	21,600,324	538
36	Lee	78,310.57	88,318,947,323	83,903,000	1071
37	Leon	32,481.22	16,960,644,677	16,112,612	496
38	Levy	5,972.85	2,424,693,592	2,303,459	386
39	Liberty	1,431.75	259,998,487	246,999	173
40	Madison	2,733.07	742,838,066	705,696	258
41	Manatee	42,095.54	33,099,465,252	31,444,492	747
42	Marion	41,785.51	22,322,733,866	21,206,597	508
43	Martin	17,699.01	21,495,314,575	20,420,549	1154
44	Monroe	7,918.47	26,715,033,370	25,379,282	3205
45	Nassau	11,026.08	8,633,670,144	8,201,987	744
46	Okaloosa	29,050.33	18,410,992,070	17,490,442	602
47	Okeechobee	6,946.94	2,341,126,348	2,224,070	320
48	Orange	170,035.61	112,467,291,492	106,843,927	628
49	Osceola	51,118.06	27,179,997,768	25,820,998	505
50	Palm Beach	169,554.39	168,502,259,637	160,077,147	944
51	Pasco	65,857.96	29,427,865,648	27,956,472	424
52	Pinellas	105,453.24	78,271,018,927	74,357,468	705
53	Polk	93,063.06	36,826,456,936	34,985,134	376
54	Putnam	11,153.94	4,305,530,317	4,090,254	367
55	St. Johns	28,787.48	24,578,936,212	23,349,989	811
56	St. Lucie	38,226.53	23,141,320,030	21,984,254	575
57	Santa Rosa	24,861.06	9,611,701,846	9,131,117	367
58	Sarasota	41,073.22	55,793,950,289	53,004,253	1290
59	Seminole	64,596.25	34,231,907,008	32,520,312	503
60	Sumter	7,381.42	6,400,710,439	6,080,675	824
61	Suwannee	5,861.48	1,802,799,414	1,712,659	292
62	Taylor	2,954.88	1,465,307,511	1,392,042	471
63	Union	2,224.97	249,479,149	237,005	107
64	Volusia	62,886.86	39,735,844,477	37,749,052	600
65	Wakulla	5,201.39	1,593,537,258	1,513,860	291
66	Walton	6,933.41	16,729,181,151	15,892,722	2292
67	Washington	3,495.65	1,085,684,247	1,031,400	295
68	Washington Special	475.68	0	0	0
69	FAMU Lab School	444.23	0	0	0
70	FAU - Palm Beach	619.61	0	0	0
71	FAU - St. Lucie	1,383.11	0	0	0
72	FSU Lab - Broward	646.50	0	0	0
73	FSU Lab - Leon	1,606.31	0	0	0
74	UF Lab School	1,146.77	0	0	0
75	Virtual School	14,000.01	0	0	0
	Total	2,618,006.46	1,814,378,625,064	1,723,659,696	658

Florida Department of Education

F-1b - 2008-09 State and Local FEFP Funds per student, Ranked

2008-09 FEFP Fourth Calculation

Value of a Mill Per FTE Ranked

	District	2008-09 Unweighted FTE	2008 School Taxable Value1	Value of a Mill	Value of a Mill Per FTE
		-1-	-2-	-3-	-4-
44	Monroe	7,918.47	26,715,033,370	25,379,282	3205
19	Franklin	1,201.15	3,504,102,998	3,328,898	2771
66	Walton	6,933.41	16,729,181,151	15,892,722	2292
11	Collier	41,986.70	80,673,457,620	76,639,785	1825
58	Sarasota	41,073.22	55,793,950,289	53,004,253	1290
23	Gulf	2,006.61	2,629,396,112	2,497,926	1245
43	Martin	17,699.01	21,495,314,575	20,420,549	1154
8	Charlotte	16,993.43	19,947,822,855	18,950,432	1115
36	Lee	78,310.57	88,318,947,323	83,903,000	1071
31	Indian River	17,398.58	18,329,983,650	17,413,484	1001
50	Palm Beach	169,554.39	168,502,259,637	160,077,147	944
18	Flagler	12,738.31	11,897,528,655	11,302,652	887
60	Sumter	7,381.42	6,400,710,439	6,080,675	824
55	St. Johns	28,787.48	24,578,936,212	23,349,989	811
41	Manatee	42,095.54	33,099,465,252	31,444,492	747
45	Nassau	11,026.08	8,633,670,144	8,201,987	744
13	Miami-Dade	342,677.77	258,145,375,277	245,238,107	716
3	Bay	25,232.05	18,991,132,748	18,041,576	715
9	Citrus	15,796.00	11,717,465,012	11,131,592	705
52	Pinellas	105,453.24	78,271,018,927	74,357,468	705
6	Broward	254,898.34	176,830,926,919	167,989,381	659
48	Orange	170,035.61	112,467,291,492	106,843,927	628
46	Okaloosa	29,050.33	18,410,992,070	17,490,442	602
64	Volusia	62,886.86	39,735,844,477	37,749,052	600
56	St. Lucie	38,226.53	23,141,320,030	21,984,254	575
5	Brevard	72,200.50	41,482,005,385	39,407,905	546
35	Lake	40,151.05	22,737,182,842	21,600,324	538
33	Jefferson	1,103.62	621,186,733	590,127	535
28	Highlands	12,239.88	6,707,786,873	6,372,398	521
42	Marion	41,785.51	22,322,733,866	21,206,597	508
49	Osceola	51,118.06	27,179,997,768	25,820,998	505
59	Seminole	64,596.25	34,231,907,008	32,520,312	503
16	Duval	123,730.29	65,401,744,384	62,131,657	502
37	Leon	32,481.22	16,960,644,677	16,112,612	496
22	Glades	1,403.39	726,618,593	690,288	492
27	Hernando	22,636.28	11,452,141,804	10,879,535	481
1	Alachua	27,293.04	13,713,347,543	13,027,680	477
62	Taylor	2,954.88	1,465,307,511	1,392,042	471
29	Hillsborough	190,104.56	89,319,306,778	84,853,341	446
51	Pasco	65,857.96	29,427,865,648	27,956,472	424
24	Hamilton	1,843.68	764,365,634	726,147	394
17	Escambia	40,335.18	16,435,045,831	15,613,294	387
38	Levy	5,972.85	2,424,693,592	2,303,459	386
53	Polk	93,063.06	36,826,456,936	34,985,134	376
54	Putnam	11,153.94	4,305,530,317	4,090,254	367
57	Santa Rosa	24,861.06	9,611,701,846	9,131,117	367
14	DeSoto	4,996.94	1,903,101,906	1,807,947	362
26	Hendry	7,005.46	2,442,657,068	2,320,524	331
47	Okeechobee	6,946.94	2,341,126,348	2,224,070	320
25	Hardee	5,153.67	1,696,823,206	1,611,982	313
67	Washington	3,495.65	1,085,684,247	1,031,400	295
10	Clay	35,844.38	11,014,229,027	10,463,518	292
15	Dixie	2,061.53	633,774,565	602,086	292
61	Suwannee	5,861.48	1,802,799,414	1,712,659	292
65	Wakulla	5,201.39	1,593,537,258	1,513,860	291
4	Bradford	3,235.49	942,103,857	894,999	277
12	Columbia	9,990.66	2,810,618,069	2,670,087	267
21	Gilchrist	2,643.62	731,272,524	694,709	263
40	Madison	2,733.07	742,838,066	705,696	258
20	Gadsden	5,963.10	1,518,898,504	1,442,954	242
34	Lafayette	1,088.65	250,357,700	237,840	218
32	Jackson	7,076.13	1,553,119,549	1,475,464	209
39	Liberty	1,431.75	259,998,487	246,999	173
2	Baker	4,942.29	892,096,547	847,492	171
7	Calhoun	2,197.33	382,917,219	363,771	166
30	Holmes	3,342.38	452,493,551	429,869	129
63	Union	2,224.97	249,479,149	237,005	107
68	Washington Special	475.68	0	0	0
69	FAMU Lab School	444.23	0	0	0
70	FAU - Palm Beach	619.61	0	0	0
71	FAU - St. Lucie	1,383.11	0	0	0
72	FSU Lab - Broward	646.50	0	0	0
73	FSU Lab - Leon	1,606.31	0	0	0
74	UF Lab School	1,146.77	0	0	0
75	Virtual School	14,000.01	0	0	0
	Total	2,618,006.46	1,814,378,625,064	1,723,659,696	658

F-2 - FLORIDA'S PROFILE IN THE CER REPORT

The Center for Education Reform 'RACE TO THE TOP' FOR CHARTER SCHOOLS

Which States Have What It Takes to Win

Charter School Law Ranking and Scorecard 2010

LAW	
Year Passed	1996; last amended in 2008.
Rank	12th strongest of the nation's 40 charter laws.
Grade	B
GENERAL DATA	
	â€¢ Steady growth despite many state regulations, including class size requirements â€¢ Unchallenged lawsuit against newly created independent authorizer limits approval to school boards â€¢ Funding is complicated and inadequate
MULTIPLE AUTHORIZERS - NO	
Approval	School boards (In December 2008, the state First District Court of Appeals ruled that the creation of the independent authorizer, the Florida Schools of Excellence Commission, was unconstitutional. The state did not appeal the ruling despite legal opinions supporting its constitutionality and it ceased operations.)
Appeal	Yes. Applications denied by the school board may be appealed to the State Board of Education whose decision is binding.
NUMBER OF SCHOOLS ALLOWED	
Cap	No cap
OPERATIONAL AUTONOMY	
State	Yes. Blanket waiver from state and local rules and regulations. Specific statewide statutes, such as class size limitations, apply to charter schools with no exemptions. Virtual schools are allowed. Management contracts with ESPs are not restricted.
Local	Yes. Charter schools are exempt from most local school rules and regulations with certain exceptions as prescribed by the district.

Teacher Freedom	Yes. Teachers choose to remain covered by district bargaining agreement, negotiate as a separate unit, or work independently. Teachers on approved leaves of absence must participate in state's retirement system.
EQUITY	
Student Funding	â€¢ Funding for charter schools follows same formula used for all other public schools minus administrative fees retained by school boards. â€¢ Funds pass through the district. â€¢ Average per pupil revenue - $6,200 *"Students enrolled in a charter school, regardless of the sponsorship, shall be funded as if they are in a basic program or a special program, the same as students enrolled in other public schools in the school district. (b) The basis for the agreement for funding students enrolled in a charter school shall be the sum of the school district's operating funds from the Florida Education Finance Program as provided in s. 1011.62 and the General Appropriations Act, including gross state and local funds, discretionary lottery funds, and funds from the school district's current operating discretionary millage levy; divided by total funded weighted full-time equivalent students in the school district; multiplied by the weighted full-time equivalent students for the charter school. Charter schools whose students or programs meet the eligibility criteria in law shall be entitled to their proportionate share of categorical program funds included in the total funds available in the Florida Education Finance Program by the Legislature, including transportation."* [Fla. Stat. Â§ 1002.33(17)(b)]
Facilities Funding	Yes. The state has appropriated $57 million in its capital outlay program for per pupil facilities funding, which may be used for purchasing, construction, or maintenance of facilities. It is limited to charters that meet certain criteria, including: operation for at least three years, accredited by the Southern Association of Colleges and Schools, financially and academically stable, and is an expanded feeder chain or charter within the same district (meaning an elementary charter serves a middle school which serves a high school charter.) [Fla. Stat. Â§ 1013.62(e)]

The Center for Education Reform
910 Seventeenth Street, NW, Suite 1120 â€¢ Washington, DC 20006
(tel) 800-520-2118 â€¢ 301-986-8088 â€¢ *(fax)* 301-986-1826
cer@edreform.com â€¢ www.edreform.com
copyright Â© 2009

F-3: AMERICA JOURNAL OF EDUCATION ARTICLE

Charter Ranking Roulette: An Analysis of Reports That Grade States' Charter School Laws

WENDY C. CHI and KEVIN G. WELNER
University of Colorado at Boulder

Since 1996, the Center for Education Reform has released an annual report card, grading each state's charter school legislation and labeling as the "strongest" those laws placing the fewest and slightest restrictions on charter schools. While the Center for Education Reform rankings have undoubtedly been the most influential, at least four other systems have been developed. In this article, we analyze the different ranking systems, including a new approach we have developed in order to illustrate the arbitrariness of any given ranking system and to highlight some key charter school issues. We then investigate the general, popular phenomenon of rankings in the field of education, exploring the benefits, drawbacks, and appeal of such rankings.

Introduction

Since 1996, the Center for Education Reform (CER) has released an annual state-by-state report card, grading each state's charter school legislation on a scale of "strong" to "weak" (see CER 2006). These ratings assess the free-market emphasis of each state's law; those laws placing the fewest and weakest restrictions on the formation and operation of charter schools are identified as the strongest laws. This approach is consistent with two of the rationales behind the charter school movement: an opposition to governmentally imposed rules and restrictions and a trust in the pressures of the competitive marketplace.

The CER rankings have been influential. Each year when the grades are released, newspapers publish credulous stories identifying their home state law as strong or weak (e.g., Lucadamo 2003; *Pueblo Chieftain* 1998). Purportedly impartial organizations such as the Education Resources Information Center

Electronically published December 14, 2007
American Journal of Education 114 (February 2008)
© 2007 by The University of Chicago. All rights reserved.
0195-6744/2008/11402-0005$10.00

(ERIC) have similarly reproduced the CER rankings with no critique or cautionary note (Hadderman 1998). *Education Week*'s "Quality Counts" has uncritically incorporated CER's charter law grades into its own state rankings (Orlofsky and Olson 2001). As Scott and Barber (2002, 5) note, "It is common to find the strong/weak framework used in news media reports and academic research without explication of its meaning. We suspect that some use the descriptor without knowing the values supporting it."

Yet a variety of goals and visions for charter schools have never been included in CER's reports. For instance, among the prominent initial goals for the charter movement are such items as curricular innovation and service to at-risk student populations (Bulkley and Fisler 2002). Omitting these and other initial objectives has the effect of shifting the goalposts—judging the value of laws by different standards than those on which the laws were established. Moreover, a person is effectively misled if she is simply told, "The charter school law in State X got a grade of C," without also being informed of assessment criteria as well as the political goals and ideological beliefs underlying the grade.

At least four other approaches have been proposed as alternatives for gauging the value and success of charter school laws (AFT 1996; Miron 2005; Scott and Barber 2002; Witte et al. 2003). In this article, we supplement these four alternative proposals with one of our own, not so much to propose an improved grading system but rather to critique the current use of rankings through a series of comparisons. More broadly, we then expand our focus on existing and potential charter law rankings into an exploration of the general, popular phenomenon of rankings in the field of education.

Charter Schools

In 1974, Ray Budde presented a paper suggesting that local school boards grant contracts, which he called "charters," to teachers to explore new teaching

---

WENDY C. CHI is a doctoral student of the Educational Foundations, Policy, and Practice program at the University of Colorado at Boulder. She received her JD from the University of Michigan in 2003. Her research interests include educational policy and law, with a focus on charter schools. KEVIN G. WELNER is a professor and the director of the Education and the Public Interest Center (EPIC) at the University of Colorado at Boulder. His research examines school reform as well as the intersection between education rights litigation and educational opportunity scholarship. He is the author of *Under the Voucher Radar: The Emergence of Tuition Tax Credits for Private Schooling* (New York: Rowman & Littlefield, 2008).

Appendix
Page 406

ideas in exchange for increased accountability (Budde 1988). The idea gathered dust until he published it in 1988 and caught the attention of Albert Shanker, then president of the American Federation of Teachers (AFT). Shanker further publicized and expanded this concept by proposing that local school boards provide charters to form new schools (Bracey 2000; Nathan 1996a). In 1991, Minnesota became the first state to pass charter school legislation (Hadderman 1998). Since that time, the number of charter schools has grown at a rapid pace. Currently, 40 states plus the District of Columbia have charter schools, with total enrollment exceeding 1 million (CER 2007).

The approach gained bipartisan support, much of which still exists. However, research indicates that the schools have, on average, little or no positive effect on student achievement but do have unintended consequences (Carnoy et al. 2005), calling into question the long-term vitality of the reform. Several studies show increased student segregation—by race, socioeconomic status, prior test scores, and special education status (Bifulco and Ladd 2006; Cobb and Glass 1999; Howe et al. 2001; Howe and Welner 2002; Weiher and Tedin 2002). In addition, charter schools can cause adverse budgetary consequences to local public school districts (Plank and Sykes 1999; Smith et al. 2003).

Author Perspective

One of our contentions in this article is that ranking systems are most worthwhile when readers understand the values, interests, and perspectives of the authors. A key element of our own perspective arises out of our overarching concern for educational equity. We take very seriously the research showing an association between increased charter schools and increased segregation. At the same time, we are heartened by those charter schools that provide new and promising opportunities to low-income students of color, among others. This perspective is seen, for instance, in our inclusion of the reform goal of serving at-risk children. More broadly, we place a high value on policy making being informed by comprehensive and comprehensible reporting of research.

Study Overview

Evaluation criteria are not value-free (House and Howe 1999). Rather, these criteria can arise from such sources as a client's request, the evaluator's own values, or a desire to make the evaluation useful (Joint Committee on Standards 1994). CER's rankings frame the charter school movement and the success of that movement around a set of beliefs that places the highest value on the free market. From this perspective, a charter school law with fewer

Appendix
Page 407

governmental constraints is, by definition, good and strong.[1] In contrast, the evaluation approach advocated by the AFT penalizes charter school legislation that tends to create an alternative school system serving a few, select students; it rewards charter school legislation that serves a broader public interest and facilitates improvement of the public education system (AFT 1996).

But these are just two options; we found three others. Witte et al. (2003) use two dimensions to analyze charter school laws: (1) the laws' flexibility, freedom, and support for the new schools and (2) the degree of public accountability required of charter schools. The first dimension is similar to the CER approach; the second dimension adds criteria that Witte and his colleagues consider to be key to a more complete evaluation. Scott and Barber (2002) analyze charter school legislation from three prominent states—California, Arizona, and Michigan—using a framework that examines how well the laws advance the goals of choice, productive efficiency, equity, and social cohesion. Miron (2005) focuses on factors that he has empirically found to be important for higher student achievement in charter schools.

The first part of this article describes the CER rankings and their influence. Next, we present the alternatives developed by the AFT (1996), Miron (2005), Scott and Barber (2002), and Witte et al. (2003). To these, we add a fifth alternative, designed by us to emphasize our critique of the capriciousness of rankings. In our alternative, we view the success of the charter school movement as dependent, at least in part, on the degree to which it is designed to accomplish the goals on which the concept was originally promoted.

Together, these six different approaches highlight the arbitrariness of any given ranking system. A reader with a complete understanding of the ranking criteria could make good use of any of these approaches. However, the rankings by themselves, without that complete understanding, are confusing and misleading.

The article's final section uses this case study to more broadly consider the popularity of rankings in the field of education. Given that the media and the broader public tend to find these rankings interesting and useful, we consider how such information might be more critically presented and consumed.

Ranking and Evaluation Approaches

In table 1, we have set forth a summary comparison of the various criteria used in these six approaches. Looking down the columns, one sees different emphases for each rating or evaluation method: (*a*) autonomy and growth (CER), (*b*) broad benefits to public education (AFT), (*c*) competing values (Scott and Barber), (*d*) flexibility and accountability (Witte et al.), (*e*) empirically

Appendix
Page 408

TABLE 1

Comparison of Evaluation Criteria

	CER	AFT (1996)	Scott and Barber (2002)	Witte et al. (2003)	Miron (2005)	Chi and Wellner (2008)
Assistance in creating new schools	Y			Y	Y	
Bipartisan support for legislation					Y	
Broad service to community		Y				
Equity			Y			Y
Facilitates improvement of the public education system		Y				
Facilitates innovation within the public realm						Y
Faster and more growth	Y					
Less regulation and more choice	Y		Y	Y		
Minimal (and overseen) involvement by for-profits (EMOs)					Y	Y
Productive efficiency			Y			
Public accountability (renewal procedures, performance reports, and fulfillment of state standards)				Y		Y
Results in higher student achievement						Y
Rigorous approval process					Y	
Rigorous oversight process					Y	Y
Slow growth to allow for learning and adjustments					Y	Y
Social cohesion			Y			
State financial support	Y				Y	
Strong evaluation component					Y	Y

NOTE.—CER = Center for Education Reform; AFT = American Federation of Teachers; EMOs = educational management organizations.

derived criteria of effectiveness (Miron), and (*f*) original rationales and goals (Chi and Welner). These approaches and criteria are each discussed below.

Autonomy and Growth

From the perspective of CER, the best charter school laws are those that facilitate the easiest path for charter creation and the least regulation for operating charters. In a nutshell, CER favors a free market for the creation and operation of charter schools. Laissez-faire rules are seen as the way to improve educational quality and efficiency, with charters using their autonomy to innovate, to enhance parental involvement and teacher professional opportunities, and "to create focused learning communities and high levels of accountability, . . . [which] will result in higher levels of performance" (Miron 2005, 1–2).

In its 2006 rankings, CER used 10 criteria—focused on faster and easier growth in the number of schools and on greater autonomy for those schools—for its determination of strong charter school laws (those criteria are set forth in full on p. 5 of CER [2006]). These criteria were then applied to states' laws by a panel of free-market advocates from the CER itself, as well as the Fordham Foundation, the Hudson Institute, and the Pioneer Institute (CER 2001, 1). Of note, the political and ideological goals embodied in the CER criteria were also embodied in this panel that applied the criteria. The rankings are essentially an applied version of a shared free-market ideology among these panel members. Accordingly, a hypothetical spokesperson for an organization might say, "Charter schools should be completely freed from the restraints of labor agreements and state regulation." Or she might say, "Arizona's charter school laws are strong because they are overwhelmingly freed from the restraints of labor agreements and state regulation." The second statement is no less subjectively linked to ideology than the first.

Broad Benefits to Public Education

As noted above, the late AFT president Albert Shanker was one of the earliest proponents of charter schools (Shanker 1988). In 2002, however, the union released a well-publicized report concluding that student achievement was no better (and was sometimes worse) in charter schools as opposed to other public schools. More important for our purposes, the report criticized the shift in the justification for charter schools "from one that is based on education and innovation to one that is based on choice and competition" (AFT 2002, 7).

Six years earlier, the AFT had released a report that raised some of these

same concerns but did so in a more preliminary and less critical way. That AFT (1996) report essentially pushed for their preferred model of charter schools in the same way that the CER reports push for theirs. The evaluative criteria set forth by AFT include "the likelihood that [the law] will produce quality schools"; yield "examples of how the larger system of public schools should operate"; "allow for experimentation, while at the same time ensuring quality schooling within a system that protects the public interest and the integrity of public education"; avoid producing "an alternative school system created for a few, but operating at the expense of many"; ensure "public accountability for student achievement"; guarantee "accessibility [for] all students"; and empower teachers (AFT 1996, 7).

The report's application of these criteria to each state's laws did not result in a ranking or a graded report card. Instead, each state's system is described and critiqued, along with summary statements such as, "California meets most of the criteria for good charter school legislation. However, it does not extend collective bargaining for employees to new charter schools and does not require teacher certification" (AFT 1996, 35). The report concludes that no state's charter school legislation satisfied all the criteria indicating a good law "likely to produce quality education and be the basis for widespread reform of public education" (AFT 1996, 15). Arizona, the state held out by CER for the most praise, drew the harshest criticism from the AFT because its law "emphasizes the quantity of schools created rather than the quality of education provided" (AFT 1996, 15).

Competing Values

To critique the CER and AFT approaches, Janelle Scott and Margaret Barber formulated a framework grounded in four competing values concerning schooling in the United States (Scott and Barber 2002). The rubric they applied was developed by Henry Levin in the context of vouchers (Levin 2000). Scott and Barber propose that state charter school laws be analyzed based on pursuit of one or more of the following four goals: choice, productive efficiency, equity, and social cohesion. The final term is defined as "the extent to which the public school systems promote common educational experiences to diverse populations of students" (Scott and Barber 2002, 30). Using this four-goal rubric, they highlight the values inherent in the AFT and CER frameworks: "absent from the CER rubric are any provisions for student access, optimal working conditions for teachers, or targeted resources for charter schools serving low-income populations. The AFT framework emphasizes more regulation and potentially less freedom of choice" (Scott and Barber 2002, 6).

Importantly, Scott and Barber do not reject the usefulness of frameworks

grounded in such values; instead, they persuasively assert that value orientations in such evaluations should be overt. Moreover, they emphasize the conflicting values inherent in policy decisions of this nature. Their framework brings these conflicts to the fore, helping policy makers realize that their decisions regarding charter school legislation will involve important trade-offs. Given this approach, it should not be surprising that Scott and Barber do not grade or rank the state laws; the framework provides no basis on which to prefer, for instance, a law that emphasizes equity at the expense of choice or emphasizes choice at the expense of social cohesion. Which set of rules is preferable is a decision to be made by informed policy makers.

Flexibility and Accountability

The CER rankings were also critiqued at the outset of a paper by Witte et al. (2003), but the criteria they settled on have a great deal in common with CER's. These authors retained the basic CER tenet that a law with more "flexibility" (their term for fewer legal restrictions) should receive higher scores. However, they also "argue that these [charter school] laws are multidimensional; something that the CER scale fails to capture" (Witte et al. 2003, 1). Accordingly, they added a second dimension, focused on the level of public accountability required of charter schools. This dimension has three elements: renewal procedures, performance reports, and fulfillment of state standards. Applying these criteria to the states, they found a high correlation between flexibility and accountability. That is, laws that tend to have a more free-market orientation also tend to require more public accountability, so the resulting state-level ratings for the laws are similar to CER's (although Witte's paper sets forth this conclusion, it does not include a state-by-state listing of the ratings).

Empirically Derived Criteria of Effectiveness

As of early 2005, Gary Miron had conducted nine large-scale evaluations of charter schools, in six different states (Michigan in 1999 and 2002, Pennsylvania in 2000 and 2002, Illinois in 2002, Connecticut in 2002 and 2005, Ohio in 2005, and Delaware in 2004). Based on those evaluations and on a study of the correlates of success in charter schools, he contends that the criteria for considering strong charter school laws should be empirically derived. That is, since we now have a good idea about what works, we should judge the laws with that knowledge in mind. As did the other authors discussed above, Miron (2005) begins his paper with a critique of the CER approach:

TABLE 2

Comparison of Miron's Judgments, CER's 2006 Rankings, and Chi and Welner's Rankings

	Miron	CER	Chi and Welner
Delaware	First (strongest)	A (third strongest in United States)	B (ninth strongest in United States)
Connecticut	Second (strongest)	C (thirty-first strongest)	B (twelfth strongest)
Pennsylvania	Third (moderate)	B (eleventh strongest)	D (thirty-first strongest)
Illinois	Fourth (moderate)	C (twenty-eighth strongest)	A (fourth strongest)
Ohio	Fifth (weak)	B (twelfth strongest)	B (sixteenth strongest)
Michigan	Sixth (weak)	A (fifth strongest)	F (fortieth strongest)

NOTE.—CER = Center for Education Reform.

"Contrary to [the CER] assumptions, we have seen from our research and state evaluations that permissive laws and states with large numbers of charter schools are often less likely to have positive outcomes" (Miron 2005, 1).

Miron and his colleagues judged two of their six states to have charter school reforms with weak or mixed results (Pennsylvania and Illinois), two with positive results (Connecticut and Delaware), and two with negative results (Michigan and Ohio; Miron 2005). Table 2 shows no obvious correlation between Miron's rankings, the CER (2006) rankings, and our own rankings (discussed further below). Although all agree that Delaware's law is strong, the differing approaches reach very different judgments about the other five states.

Comparing his successful and unsuccessful states, Miron (2005) identifies eight key components of strong charter school laws. These include only two items (assistance in creating new schools and the need to have solid state financial support) that are an area of clear agreement with CER (2006) and several items (slow growth, as well as rigorous oversight and approval) that are in direct conflict with CER (see table 1).

Original Rationales and Goals

We find a great deal that is sensible and useful in these earlier evaluative and ranking criteria. But we contend that they all pay insufficient heed to the original goals set forth by charter school advocates. These concerns have prompted us to develop our alternative approach to assessing the merits of charter school laws. We want to stress up front, however, that rather than simply adding one more voice to the dissonant chorus championing some

state's laws above others, we are presenting this alternative ranking system to highlight our critique. Accordingly, while our exercise includes a ranking and grading of states, we emphasize that our main critique is not that the wrong criteria are used in ranking exercises; it is that the arbitrariness and underlying beliefs are not well understood by consumers.

We began by first establishing categories aligned with the initial goals of the charter school movement—those objectives that were used by charter school advocates in the early 1990s to lobby for the laws. To create a fair and comprehensive list of these goals, we went back to early, seminal works—primarily those of Joe Nathan (1994, 1996a, 1996b, 2002) and Ted Kolderie (1990, 1992, 1995; see also Bulkley and Fisler 2002; Cookson 1994; Gill et al. 2001; Henig 1994; Mintrom and Vergari 1997; and Miron 2005). We also reviewed the state charter school legislation itself to ascertain the rationales articulated by legislative authors.

Based on this comprehensive review of early charter school advocacy and of the rationales stated in state charter school legislation, we derived seven important goals: (1) curricular and instructional innovation, (2) waivers of bureaucratic rules, (3) maintaining the public nature of charter schools, (4) increased access to opportunities for at-risk students, (5) performance-based accountability, (6) increased student achievement, and (7) learning about the reform's potential and best practices through evaluation of initial small-scale efforts. We combined goals five and seven, yielding six main categories: (1) innovation, (2) waivers, (3) public realm, (4) at-risk access, (5) accountability and evaluation, and (6) achievement. From this process, we yielded seven subscale categories within the six main categories, which split into 22 items at the next level. Two primary types of sources supplied our state-level data: the state charter school laws themselves, plus existing compilations of information from organizations such as the Education Commission of the States (ECS), U.S. Charter Schools Inc. (http://www.uscharterschools.org, run by WestEd), CER, the Fordham Foundation, and the U.S. Department of Education. In general, our rankings were produced through the same approach as earlier rankings from CER and others. That is, we assigned scores and weights to each of our main categories and subcategories and then assigned cut scores in order to allot grades that differentiate between states. We used a coding scheme from −2 to + 2, which treats neutral laws as zero. Figure 1 summarizes the scores. (For a full itemization of the scoring and a breakdown of each state's scores, please see the appendix in the electronic version of this article.) To make our exercise parallel to those of CER and others, we have also included a letter grade for each state.

For some categories, ordinal rankings are inappropriate, but the criteria lie at the heart of our concerns; our analysis of such items is presented as a narrative discussion rather than a ranking or a grading. Also, the rankings

Appendix
Page 414

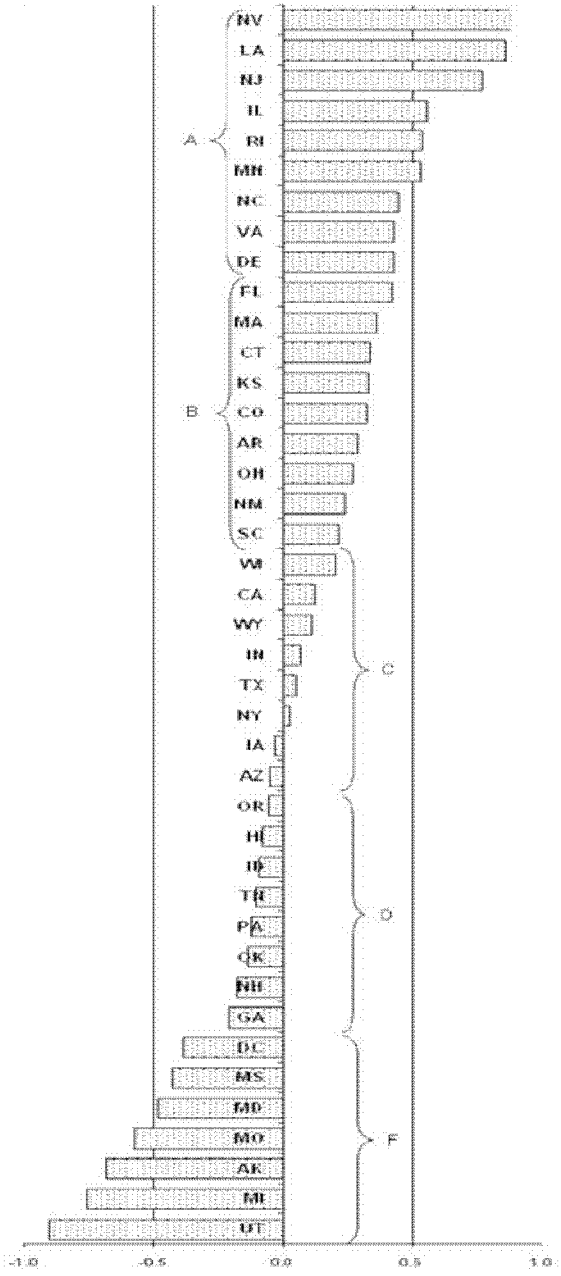


FIG. 1.—State rankings and grades

are not meant as an evaluative judgment of the efficacy of a law. That is, although we may praise a law for including a provision to promote service of at-risk populations, we are not weighing in on the question of whether that provision has been successfully implemented. Furthermore, our assigning of a grade is based only on available data; missing data are treated neutrally when appropriate, with that factor not increasing or decreasing a state's score. (For specifics, please see the appendix in the electronic version of this article.) With those caveats, we now describe the categories.

Innovation.—Our first category based on the goals of the original charter school proponents concerns the importance of innovation. The early rhetoric about innovation was extensive and powerful. Ted Kolderie expressed the general sentiment as follows: "Only new [charter] schools can stimulate the widespread innovation that public education needs" (Kolderie 1990, 7; see also the discussion in Lubienski [2001], 10–11). In a nutshell, traditional public schools were characterized as stuck in bureaucratic stagnation, rarely trying creative and new instructional approaches. Charter schools would be laboratories of new ideas; the best ideas would then be adopted by public schools if they hoped to survive in the competitive marketplace. All the while, the schools would retain their public nature (Kolderie 1990).

Even though we judge this to be a key initial goal for the reform, we do not include innovation in our ranking system because of practical difficulties in distinguishing differences in state laws. Further, judging from the analysis of Lubienski (2001) as well as the lack of specifics in laws, the vast majority of states do not appear to be demonstrating any serious commitment to this issue (see also Wong and Shen 2001). Only one state, Massachusetts, indicates a preference for applications with an innovative educational plan (see ECS 2006). It appears that state laws have incorporated, in their legislative intent, the rhetoric concerning the importance of innovation, but authorization rules and funding opportunities do not concretely advance the goal.

Lubienski (2001) points out that the same market mechanisms that were expected to prompt innovation may actually be stifling it. A new school hoping to attract customers is often wise to base that appeal on a known commodity. Traditional instructional approaches are thus very common in charter schools (Lubienski 2001). Of course, charter schools do bring, almost by definition, innovation in school governance. And, as Lubienski (2001) notes, they also tend to lead to more diversification of instructional models, giving parents options in a more diverse marketplace. However, our "original intent" focus asks whether states have effectively promoted curricular and pedagogical innovation, and the various state laws appear to have come up short.

Waivers.—Our second category involves the waiver provisions of state laws. Through the granting of waivers from burdensome, bureaucratic provisions, charter schools are intended to have more autonomy in exchange for greater

accountability (an issue discussed later in this article). Early charter school advocates believed that an increase in autonomy through these waiver provisions would contribute to favorable outcomes such as higher student achievement and progress toward educational equity (Nathan 1996a). State law waiver provisions include automatic waivers, specified waivers, exemptions at the discretion of the state board of education, and waivers provided in each specific charter. We have no empirical or even strong theoretical basis to favor one type of waiver provision over another—particularly one that links back to the early goals of the charter school movement. Thus, we have decided to forgo the grading of these provisions.

Public realm.—In contrast, the public realm aspect of charter schools can be graded. For instance, the extensive involvement of private entities, such as educational management organizations (EMOs), in the provision of instructional services is contradictory to the goal of having charter schools remain within the public realm, as opposed to a shift from public to private in the provision of services. Early advocates of charter schools focused on the public nature of these schools, arguing that their creation would increase the parental choices for public education (Bulkley and Fisler 2002). The role of EMOs can vary widely, from contracting a specific service to managing the entire school (Bulkley and Fisler 2002). By definition, such privatization detracts from the public nature of charter schools (see Molnar [2001] for a more complete critique). Notwithstanding some potential advantages to private-sector involvement—primarily, the infusion of stronger market forces—laws (even those providing for public oversight) that allow for greater EMO involvement undermine the initial vision of charter policies as a public-realm, school-choice alternative to voucher policies. For this reason, we rewarded states that have legislative provisions prohibiting for-profit organizations from applying for charter schools. This reward was greater for states that go beyond prohibiting applications to also prohibiting for-profit organizations from operating or managing the schools under contract with the nominal applicant.

At-risk access.—Early advocates believed that the charter school movement would lead to increased access to opportunities for at-risk students, and whether charters are achieving this goal has been the subject of considerable research (see Bracey 2000; Gill et al. 2001; Nathan 1996a). In a nutshell, the variation among states is extensive. In states where charter schools tend to be located in suburban areas (e.g., Colorado), they enroll a relatively small percentage of students of color and students of poverty. In states where charter schools tend to be located in urban areas (e.g., Michigan), they enroll a relatively large percentage of such students. Yet the more important empirical question for those interested in issues of stratification is not at the state level; it is at the community level. How do charter schools compare to their neighborhood public schools in terms of enrollment of at-risk students? Local seg-

regation associated with school choice appears to be happening in some, but not all, jurisdictions (see Bifulco and Ladd 2006; Booker et al. 2005; Weiher and Tedin 2002; Wong and Shen 2001).

As reflected in our grading procedures, state charter school laws themselves can advance the needs of at-risk communities by giving priority to schools that are specifically designed to address those needs, as well as by encouraging and favoring schools that are designed to limit segregation. Since our analysis looked at laws in effect prior to the 2007 Supreme Court case barring race-conscious student assignment policies (*Parents Involved in Community Schools v. Seattle School District*, 127 S.Ct. 2738, 168 L. Ed.2d 508 [2007]), we counted racial guideline provisions as indicators that the state is striving to make charter schools accessible to at-risk students. Specifically, it would be commendable for states to push for a charter's racial enrollment to reflect the surrounding school district. Federal regulations as well as equal protection jurisprudence essentially prevent states from requiring charter schools to use race or ethnicity as a selection criterion in making individual enrollment decisions. Under the federal regulations (applicable to charters that receive assistance through the federal charter school grants program), schools must use a random lottery when oversubscribed (the regulations allow some preferences for, e.g., children of a school's founders, but no preferences are allowed for at-risk students or for the promotion of a diverse student body; U.S. Department of Education 2004b). However, all charter schools can seek to increase applications by minority or underrepresented groups, as they are mandated to do in Connecticut (*Connecticut General Statutes*, sec. 10-66bb).

At-risk students may also be harmed if states allow preferential treatment in the charter school application process to one or more groups of privileged applicants. For instance, access for at-risk students tends to be hampered when charter schools grant a preference to students who are children of founders and teachers. Our ranking system reflects this concern. In contrast, we rewarded states that increase access to opportunities for at-risk students by creating charter schools that serve at-risk students or that recruit at-risk populations.

The accessibility of charter schools to at-risk students is also affected by the transportation accommodations for these students, as the lack of transportation can disproportionately prevent at-risk students from attending charter schools. Accordingly, our grading system rewards laws that require charter applicants to include a transportation plan in their applications, indicating an effort toward transportation accommodations for students. Even more important, some state laws provide transportation for charter school students residing within a certain distance of the school. Most impressively, the charter school law in Kansas has a transportation provision targeting low-income students.

A subset of the at-risk population is composed of students with disabilities.

Because of real and perceived costs, some charter schools have attempted to avoid enrolling such students (Welner and Howe 2005). To prevent such behavior, federal law requires all charter schools to have nondiscriminatory admission procedures, and some states demonstrate commitment to this issue by expressly prohibiting discrimination in admissions on the basis of disability in their charter school laws. Furthermore, it is commendable when state laws favor applications that express a focus on accommodating special education students or that show a preference for at-risk students. States are also rewarded in our grading system for including provisions identifying at-risk students as target populations (Fiore and Cashman 1998).

Accountability and evaluation.—Charter schools were proposed as an innovation with the potential to improve education by shifting from bureaucratic accountability to performance-based accountability. Each charter contract would set forth how the particular school would be held accountable. Accountability, then, varied in its particulars from school to school, but the unifying constant was that charter schools would all be expected to demonstrate their performance.

An important factor, which we found only partially gradable, is related to charter revocation. Early charter school proponents believed that the fear of revocation would motivate schools to perform (Kolderie 1990). If promised outcomes are not achieved, then the school's side of the contract is not met, and the charter will be revoked or nonrenewed. Many states include boilerplate language concerning revocation. Most charter school laws (all except Maryland) list grounds for terminating a school's charter, and many are similar in content and phrasing (ECS 2006).[2] Inclusion of such provisions is a positive feature of laws, even if the language appears to be pro forma, since it provides criteria for determining whether to revoke a charter. Among other things, this helps to address due-process concerns about adequate notice.

Our grading procedure rewarded states that allow charter schools to have an opportunity to cure a violation. Evaluative procedures should be in place such that charter schools that are in danger of being revoked due to a violation are, except in extreme cases, notified in advance and thus have the chance to solve their problems. However, states must be willing to revoke charters if necessary; otherwise, charter schools are no longer held accountable. In this subcategory, we developed an index by dividing the percentage of revocations by the number of years that the state has had charter schools. The index represents the degree to which states enforce the closure of their schools. In addition, states that allow revocations to occur via voting procedures illustrate the degree to which they are willing to revoke. Specifically, some states indicate that they will terminate a charter school if there is a majority vote from the staff or parents in support of revocation.

The accountability of charter schools is also dependent on adequate mon-

itoring and evaluative procedures. States should have a system in place that provides monitoring on a regular basis. Specifically, according to the Fordham Foundation, states vary in their ability to provide "periodic announced visits by authorizers," to require "periodic financial audits and progress reports," and to supply a method of reviewing reports, flagging problems, and notifying schools (Palmer and Gau 2003, 108). Moreover, monitoring should extend to the enforcement of school improvement actions and the oversight of academic achievement unrelated to No Child Left Behind (NCLB) academic performance goals (U.S. Government Accountability Office 2005).

A thorough evaluation of each school ensures accountability by encouraging the approval of only high-quality charter applications and the closure of schools that are performing poorly (Miron 2005). Until 2002, however, some states did not include charter schools in their standards-based testing policies (NCLB now effectively requires such inclusion). Moreover, while the accountability of charter schools is most often framed in terms of student achievement, charter school closures have more often been due to organizational problems such as management and fiscal failures than due to issues of achievement (Bulkley and Fisler 2002).

The above accountability and evaluation factors were graded as seven different items and used to generate an evaluation subscore. Similarly, three items of the accountability and evaluation category were graded as components of a subscore concerning issues of charter duration and caps. Contrary to CER's view that states have strong charter school laws if they do not limit the number of charter schools to be formed, we believe that there should be a cap on the number of charter schools a state can have, in order to support the pilot study/evaluation aspect of the charter school movement (Miron 2005). Early charter school advocates believed in the evaluation of initial small-scale efforts to learn about the potential of charter school reform. Kolderie, for instance, described a "gradual development" of a system of charter schools, including a process of "evaluating the performance" of the reform as it moves along (1990, 9). Given that extant research findings raise serious questions about the effects of charter policies, the initial ideas favoring pilot studies and careful evaluation are still salient. Although caps constrain free-market pressures and effectively reduce parental choice, states' failure to place a cap on the number of charter schools creates an unregulated environment that can be detrimental to students and to the long-term success of the charter school movement. A cap provision may allow only a certain number of charter schools within a geographic region, may allow the number to increase incrementally, or may set an absolute cap statewide. All of these types of caps allow for some control over the development of charter schools, although a true cap provides the most concrete regulation.

The duration of a charter is also indicative of a good law. Longer charters

undermine two goals: (1) pilot study/evaluation and (2) accountability for obligations in the charter contract. Even charter schools that have been in existence for a substantial period of time should have relatively short charter terms since the accountability design for all charters requires the monitoring and evaluation that takes place during reauthorization. States should also require meaningful reviews before the charter term expires. Each of these factors is included in the caps/duration subscore.

Achievement.—Our sixth main category focuses on issues of student achievement. The need for increased student achievement was a main impetus of early charter school advocates, who argued that improvements would result from autonomy, competition, innovation, and accountability (Bulkley and Fisler 2002).

We have, however, not included a score for achievement because valid outcome measures at the state level are largely unavailable. The issue of how to best measure achievement outcomes is itself the subject of a great deal of controversy. Most studies reporting on charter achievement have little value because they simply compare average scores of students in each sector (charters and noncharters) without accounting for differences in the enrolled students. Not surprisingly, in states such as Michigan, where charters are located in lower-scoring urban areas, the charters do less well; in states such as Colorado, where charters are located in higher-scoring suburban areas, charters do better.

Higher-quality longitudinal and cross-sectional studies control for such enrollment differences (e.g., Bifulco and Ladd 2003; Braun et al. 2006; Finnigan et al. 2004; Lubienski and Lubienski 2006; Sass 2006; U.S. Department of Education 2004a) and have tended to show that charter schools perform less well or at the same level as compared to other public schools (see discussion in Carnoy et al. [2005]). At least one study reached the opposite conclusion (Hoxby 2004; for a critique of Hoxby's analysis, see Roy and Mishel [2005]). For our purposes, we think it most important simply to note that any attempt to judge the success of a given state's charter school policy should include a rigorous examination of student outcomes. In this regard, we stress that outcomes studied should move beyond achievement tests to include other outcomes of importance such as graduation, matriculation to college or obtaining of employment, as well as attendance and dropout rates.

The Results of Our Ranking System

The big winners under our ranking system were Nevada, Louisiana, and New Jersey; those faring the worst were led by Missouri, Alaska, Michigan, and Utah (see fig. 1, as well as the appendix in the electronic version of this article). Because the criteria we have chosen derive from our perspective and values,

these same findings could be honestly presented as, "The charter school laws in the states of Nevada, Louisiana, and New Jersey best reflect the original goals of charter policies that we have identified." Alternatively, an advocacy approach to reporting our findings might be worded as, "The charter laws in Missouri, Alaska, Michigan, and Utah all earned a grade of F. Lawmakers in those states would do well to reform their policies to better serve at-risk children, forbid EMO involvement, and so on." In the final section of this article, we discuss the reasons why authors sometimes decide to present findings using this latter, advocacy approach—and we discuss the policy-discourse repercussions of those decisions.

The Appeal of Rankings

The recent critiques of CER's approach by Miron (2005), Scott and Barber (2002), and Witte et al. (2003) went largely unnoticed. Perhaps this is in part because none of these reports included state-by-state rankings or grades of their own. For the media, they offered no hook, no lede, and no headline. In contrast, the CER rankings allow a newspaper an obvious headline and an easy local angle: "Michigan Charter Schools Get an 'A'" or "Illinois Charter Law Earns 'C' on National Report Card." Consider the following article published in the *Pueblo Chieftain*, titled, "Pueblo Charter Schools Help State Rank High in Evaluations":

> Pueblo, with its Connect School and the Pueblo School for Arts and Sciences, was an early entry in the American trend toward the charter school. . . . Earlier this month, the Center for Education Reform in Washington, D.C., released its third ranking of evaluation of [*sic*] charter school laws. Colorado moved up to 11th from 14th in the CER's assessment of state-law effectiveness. . . . Twenty-three of the laws, including Colorado's, were assessed as being strong or moderately strong, by the CER. . . . The evaluation is based on 10 categories and a detailed, individual profile on each law, said Jeanne Allen, CER president. . . . Allen said that in some states, red tape cripples charter laws from the outset. She claims that traditional public school people fight against making the new schools successful. (*Pueblo Chieftain* 1998)

If CER and its president had merely sent out an essay condemning red tape or attacking "traditional public school people" or had sent out a press release consisting simply of criticism and praise for various states, such newspaper articles would likely not be written. Accordingly, the organization chose a more newsworthy approach; each state was given a rank and then a grade.

Judgments were quantified, generating winners and losers, with the final grade giving these judgments an aura of objectivity.

In the newspaper business, there is a world of difference between "Bob Is a Good Student" and "Report Card Gives Bob an A." Readers like concrete competitions. They like following their team's standings and the horse-race aspect of election news coverage. They like movie ratings on a scale of 1–10 (or a mere thumbs up or down). At a more sophisticated level, they like the decision-making assistance provided by rankings in *Consumer Reports*. Ratings, rankings, and grades offer a shorthand allowing for quick, easy assessments and conclusions. For those with little interest in a subject or for those who simply do not have time to invest in learning about the subject in depth, nuance is the enemy. Lists, grades, and rankings are not just an efficient way to present information; they are also often enjoyable to compile and read.

The field of education is home to one of the most successful and influential rankings franchises. *U.S. News and World Report* annually ranks colleges and universities for undergraduate education as well as individual graduate programs. These rankings have drawn considerable criticism, focused on the arbitrariness of the (often-changing) formula used to calculate the rankings and focused also on the resulting distorted decision making by prospective applicants and higher-education institutions (Clarke 2004; Gottlieb 1999). Higher education rankings, however, are not limited to *U.S. News*. Shanghai's Jiao Tong University's ranking of the top five hundred public and private universities worldwide is now a regular newsworthy event (Economist 2005; see also http://ed.sjtu.edu.cn/ranking.htm). The *Times* of London's Higher Education Supplement rankings (http://www.thes.co.uk/worldrankings/) covers much of the same ground. The National Center for Public Policy and Higher Education grades state higher education systems on a variety of indicators including affordability, preparation, and completion (National Center for Public Policy and Higher Education 2004). The Education Trust recently issued a report assigning grades to flagship public universities, based on the degree to which they equitably serve the minority and low-income students in their states (Gerald and Haycock 2006).

In recent years, schooling at the K–12 level has been subject to similar treatments. In addition to the charter school rankings discussed above, the Friedman Foundation grades each state's movement toward vouchers and similar free-market approaches (Enlow 2004). The Manhattan Institute produced a grading system using what it called the "Freedom Index," a free-market ranking that attempts to cumulatively account for vouchers, charter schools, and other forms of choice (Greene 2000). The Fordham Foundation has graded charter school laws on the diversity and efficacy of allowed authorizers (Palmer and Gau 2003). Another Fordham report grades state teacher

credentialing, giving higher grades to those states favoring the free market over professionalization (Finn et al. 1999).[3]

Governmental and private organizations and publications have also released so-called report cards that rank states based on various criteria. States are graded on accountability, finance systems, and other factors by *Education Week*'s "Quality Counts" (*Education Week* 2005). Governments and newspapers grade and rank schools and school districts based on standardized test scores (Colorado State Board of Education 2005; Dedman 2004). Attempting to develop a franchise analogous the *U.S. News* higher education rankings, *Newsweek* now ranks top high schools based on student participation in advanced placement (AP) and international baccalaureate (IB) courses.[4] Not to be outdone, *U.S. News* just began its own high school rankings, based on standardized test scores and rates of participation and achievement in AP courses (but, apparently, not IB courses).[5] The approach also took into account the percentage of economically disadvantaged students at each school and the performance of black, Latino, and poor students.

Our examination of these rankings and reports yields mixed conclusions. The compilation of data underlying the efforts is admirable and valuable. But the grades themselves have great potential to cheapen the discourse around important issues. Complex matters of social policy are transformed into an ordinal competition. At a basic level, none of these rankings offer incorrect information (at least, we assume that none do so intentionally). If they are harmful, that harm comes about because of two other factors: (1) they can prompt changed behavior by readers and policy makers, and (2) they can be misleading, if readers do not understand the bases for the rankings. We contend that it is this second factor that most deserves attention and remediation.

The first factor can be subdivided into "intended change" and "unintended change." Intended change would include, for example, the lifting of restrictions on charter school laws in response to the CER rankings or increased AP and IB enrollment in response to the *Newsweek* rankings. Such intended changes are not harmful from the perspective of the producers of the rankings. And their harm from the perspective of others is no different from the "harm" caused by any successful policy advocacy.

Unintended change would include the increased use of early college admissions as a way to increase the "yield rate" that formerly was included in the *U.S. News* calculations (*Christian Science Monitor* 2003). But this phenomenon of unintended consequences is hardly unique to this type of policy document; attempts to change policy are rarely so refined that they only create intended effects. This does not mean that unintended consequences should be shrugged off—only that addressing them (i.e., by tinkering with the policy along the way) is common.

In contrast, there is a unique aspect to the misleading nature of grades and

rankings used for policy advocacy. A value-laden report presented as objective research and accepted as such by media outlets—and given a great deal of attention because of the reader-friendly ratings/grades—clouds discourse around the issue. We suggest the following, which we think will enhance the likelihood these reports will be more critically presented and consumed. The primary responsibility lies with the reports' authors, who should clearly state limitations and explain underlying values and assumptions. But a strong secondary responsibility lies with mediating institutions. The audience for these reports is really not those who read the documents themselves; instead, readers of newspapers, and consumers of other media, learn of the content only as it is reported. Even if a report is intended to deceive, it can only do so when reporters and their editors fail to provide a critical filter. The solution to the misleading aspect to these reports thus devolves to the difficult task of working with these reporters and editors, helping them to present accurate and complete stories. Much confusion could be eliminated by two sentences near the outset of a newspaper story, reading simply, "The report card was issued by the Center for Education Reform, an advocacy group for charter schools that favors fewer regulations of those schools. States were given higher grades if their charter school laws included only minimal regulations."

We look primarily to the media because novice readers of ranking or grading reports should not be expected to understand, or even to be aware of, countervailing perspectives. Nor should they be expected to know the policy objectives of a given organization. However, we note that readers can, with little effort, learn a great deal by quickly looking to the underlying criteria. A reader who is a policy maker should be expected, at a minimum, to ask about those criteria.

Conclusion

The merits of important academic studies are tested through peer review and challenged by subsequent studies and publications. No reliable academic counterpart to this rigorous process, however, has emerged for reports issued by advocacy organizations that project their efforts directly into the policy arena.[6] Yet such advocacy documents are often more influential than even the most careful academic research. By issuing report cards, rankings, and grades, organizations have found that they can make their primary arguments easily understood and can gain influence in policy debates.

A grades- or rankings-based approach of evaluating charter school laws is necessarily value dependent. Rankings are only useful to those who understand the values underlying the exercise; otherwise, they are likely to be misleading.

The CER rankings, in particular, have received most of the publicity yet are poorly presented.[7]

Each of the six ranking systems discussed above uses different criteria to determine what makes a good charter school law, and each yields different results. Not surprisingly, our own ranking system, using criteria aligned with the initial mission of the charter school movement, produced very different grades than that of CER. The examples presented in this article underscore the problems inherent in trusting such value-dependent and inconsistent grading approaches. Yet because grades are likely to remain a popular assessment tool in the educational realm, we hope that this analysis contributes to a better understanding of these limitations.

Notes

1. The use of the terms "strong" and "weak," as applied to charter school laws, likely originated with Millot (1994) and Wohlstetter et al. (1995).

2. Miron (2005, 4), however, notes that Connecticut's successful charter policy includes rigorous oversight and that a "large proportion of poor performing [charter] schools . . . have closed." He also notes that the state imposed a temporary moratorium on the granting of new charters.

3. For an excellent example of uncritical news coverage, see the *Rocky Mountain News* article about this report, which identifies the Fordham Foundation merely as "a private Washington-based foundation that backs education research and reform" (Associated Press 1999). Nowhere in the article are readers given any information that would help them understand that the grade (Colorado received a B− in this case) was grounded on a controversial ideological goal for teacher certification.

4. *Newsweek*'s rankings are derived by dividing the total number of AP or IB tests given at a school in May by the number of seniors graduating in June. Interestingly, while the National Research Council has criticized the *Newsweek* rankings for inappropriate (invalid) uses of the tests and for the potential that the popular rankings have to distort educational practices (Gollub et al. 2002, 185ff.), Jay Mathews, the person behind the *Newsweek* rankings, views more widespread enrollment in such classes as a benefit (Mathews 1998). That is, the rankings may prompt changed school practices, but that would be a positive outcome.

5. The ranking approach is described by Morse (2007). Since the approach accounts for test scores and student demographics but not selectivity (by either school selection or student self-selection), choice schools and test-based schools are notably overrepresented. According to Rotherham, fully 20 percent of the schools on the list select students based on academic merit (Rotherham 2007). Schools located in wealthy, suburban areas also appear to do very well in the new ranking.

6. We recently have helped start up the Think Tank Review Project (at http://www.thinktankreview.org), which publishes reviews—comparable to peer reviews—addressing the quality of reports issued by think tanks (Welner and Molnar 2007).

7. Robert Fox (2005) has been pursuing an ambitious project whereby he hopes to put online, as a resource to accompany the annual CER report card, a comprehensive summary of each state's charter school law and a content analysis and comparison of

Appendix
Page 426

issues such as application procedures, renewal and revocation regulations, and collective bargaining requirements.

References

AFT (American Federation of Teachers). 1996. *Charter School Laws: Do They Measure Up?* Washington, DC: AFT.

AFT (American Federation of Teachers). 2002. *Do Charter Schools Measure Up? The Charter School Experiment after 10 Years.* Washington, DC: AFT.

Associated Press. 1999. "Report Ranks Colorado 9th in Education Quality." *Rocky Mountain News*, November 16.

Bifulco, Robert, and Helen F. Ladd. 2003. "The Impacts of Charter Schools on Student Achievement: Evidence from North Carolina." Paper prepared for the Association of Public Policy Analysis and Management Annual Meeting, Washington, DC, November.

Bifulco, Robert, and Helen F. Ladd. 2006. "School Choice, Racial Segregation, and Test-Score Gaps: Evidence from North Carolina's Charter School Program." Paper presented at annual meeting of Allied Social Science Associations, Boston, January.

Booker, Kevin, Ron Zimmer, and Richard Buddin. 2005. "The Effect of Charter Schools on School Peer Composition." Working paper, RAND, Santa Monica, CA.

Bracey, Gerald. 2000. *Charter Schools.* Tempe, AZ: Educational Policy Studies Laboratory, http://www.asu.edu/educ/epsl/EPRU/documents/cerai-00-26.htm.

Braun, Henry, Frank Jenkins, and Wendy Grigg. 2006. *A Closer Look at Charter Schools Using Hierarchical Linear Modeling.* Washington, DC: National Center for Educational Statistics.

Budde, Ray. 1988. *Education by Charter: Restructuring School Districts.* Andover, MA: Regional Laboratory for Educational Improvement of the Northeast and Islands.

Bulkley, Katrina, and Jennifer Fisler. 2002. *A Decade of Charter Schools: From Theory to Practice.* Philadelphia: Graduate School of Education, University of Pennsylvania.

Carnoy, Martin, Rebecca Jacobsen, Lawrence Mishel, and Richard Rothstein. 2005. *The Charter School Dust-Up: Examining the Evidence on Enrollment and Achievement.* Washington, DC: Economic Policy Institute.

CER (Center for Education Reform). 2001. *Charter School Laws: Scorecard and Ranking.* Washington, DC: CER.

CER (Center for Education Reform). 2006. *Charter Schools Today: Changing the Face of American Education.* Washington, DC: CER.

CER (Center for Education Reform). 2007. Charter Schools. Washington, DC: CER, http://www.edreform.com/index.cfm?fuseAction=statestats&psectionID=15&csectionID=44.

Christian Science Monitor. 2003. "Early College Admissions," July 16.

Clarke, Marguerite. 2004. "Weighing Things Up: A Closer Look at the *U.S. News and World Report*'s Ranking Formulas." *College and University Journal* 79 (3): 3–9.

Cobb, Casey, and Gene Glass. 1999. "Ethnic Segregation in Arizona Charter Schools." *Education Policy Analysis Archives* 7 (1), http://epaa.asu.edu/epaa/v7n1/.

Colorado State Board of Education. 2005. *School Accountability Reports: A Five-Year Review of Progress, 2000–2005.* Denver: Colorado State Board of Education.

Cookson, Peter. 1994. *School Choice: The Struggle for the Soul of American Education.* New Haven, CT: Yale University Press.

Dedman, Bill. 2004. "Numbers Game: Making Sense of This Year's Rankings." *Boston Globe*, September 24.

Economist. 2005. "The Brains Business," September 8, http://www.economist.com/displaystory.cfm?story_id=4339960.

ECS (Education Commission of the States). 2006. ECS State Policies for Charter Schools Database, http://www.ecs.org/ecsmain.asp?page=/html/educationIssues/ECSStateNotes.asp.

Education Week. 2005. "Quality Counts: State Report Cards," January, http://www.edweek.org/ew/qc/2005/map.html.

Enlow, Robert C. 2004. "Grading Vouchers: Ranking America's School Choice Programs." *School Choice Issues in Depth* 2 (1): 1–19.

Finn, Chester, Marci Kanstoroom, and Michael J. Petrilli. 1999. *The Quest for Better Teachers: Grading the States.* Washington, DC: Fordham Foundation, http://www.edexcellence.net/doc/quest.pdf.

Finnigan, Kara, Nancy Adelman, Lee Anderson, Lynyonne Cotton, Mary Beth Donnelly, and Tiffany Price. 2004. "Evaluation of the Public Charter Schools Program: Final Report." Prepared for U.S. Department of Education by SRI International, Washington, DC.

Fiore, Thomas A., and Erin R. Cashman. 1998. *Review of Charter School Legislation Provisions Related to Students with Disabilities.* Washington, DC: U.S. Department of Education, http://www.ed.gov/pubs/chartlegis/.

Fox, Robert A. 2005. *State Charter School Legislation: An Interactive Guide and Roadmap.* Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, April.

Gerald, Danette, and Kati Haycock. 2006. *Engines of Inequality: Diminishing Equity in the Nation's Premier Public Universities.* Washington, DC: Education Trust.

Gill, Brian P., Mike Timpane, Karen E. Ross, and Dominic J. Brewer. 2001. *Rhetoric vs. Reality: What We Know and What We Need to Know about Vouchers and Charter Schools.* Santa Monica, CA: RAND.

Gollub, Jerry P., Meryl W. Bertenthal, Jay B. Labov, and Philip C. Curtis. 2002. *Learning and Understanding: Improving Advanced Study of Mathematics and Science in U.S. High Schools.* Washington, DC: National Academy.

Gottlieb, Bruce. 1999. "Cooking the School Books: How *U.S. News* Cheats in Picking Its 'Best American Colleges.'" *Slate*, August 31, http://www.slate.com/id/34027/.

Greene, Jay P. 2000. *The Education Freedom Index.* New York: Manhattan Institute for Policy Research.

Hadderman, Margaret. 1998. "Charter Schools." *ERIC Digest*, no. 118, http://www.ericdigests.org/1999-2/charter.htm.

Henig, Jeffery R. 1994. *Rethinking School Choice: Limits of the Market Metaphor.* Princeton, NJ: Princeton University Press.

House, Ernest, and Kenneth R. Howe. 1999. *Values in Evaluation and Social Research.* Thousand Oaks, CA: Sage.

Howe, Kenneth, Margaret Eisenhart, and Damian Betebenner. 2001. "School Choice Crucible: A Case Study of Boulder Valley." *Phi Delta Kappan* 83 (2): 137–46.

Howe, Kenneth, and Kevin G. Welner. 2002. "School Choice and the Pressure to Perform: Déjà Vu for Children with Disabilities?" *Remedial and Special Education* 23 (4): 212–21.

Hoxby, Caroline M. 2004. "A Straightforward Comparison of Charter Schools and Regular Public Schools in the United States," http://post.economics.harvard.edu/faculty/hoxby/papers/hoxbyallcharters.pdf.

Joint Committee on Standards. 1994. *The Program Evaluation Standards*, ed. James R. Sanders. Beverly Hills, CA: Sage.

Kolderie, Ted. 1990. "Beyond Choice to New Public Schools: Withdrawing the Exclusive Franchise in Public Education." Policy Report 8, Progressive Policy Institute Washington, DC, http://www.ppionline.org/ndol/print.cfm?contentid=1692.

Kolderie, Ted. 1992. "Chartering Diversity." *Equity and Choice* 9 (1): 28–31.

Kolderie, Ted. 1995. *The Charter Idea: Update and Prospects*. St. Paul, MN: Center for Policy Studies.

Levin, Henry. 2000. "A Comprehensive Framework for Evaluating Educational Vouchers." Occasional Paper 5, National Center for the Study of Privatization in Education, Teachers College, Columbia University.

Lubienski, Christopher. 2001. "Charter School Innovations in Theory and Practice." Paper presented at the Educational Issues in Charter Schools Conference, Washington, DC, November.

Lubienski, Christopher, and Sarah T. Lubienski. 2006. "Charter, Private, Public Schools and Academic Achievement: New Evidence from NAEP Mathematics Data." National Center for the Study of Privatization in Education, Teachers College, Columbia University, http://www.ncspe.org/publications_files/OP111.pdf.

Lucadamo, Kathleen. 2003. "N.Y. Charter School Laws Get 'B.'" *New York Sun*, January 16.

Mathews, Jay. 1998. *Class Struggle: What's Wrong (and Right) with America's Best Public High Schools*. New York: Times Books.

Millot, Marc D. 1994. *Autonomy, Accountability, and the Values of Public Education: A Comparative Assessment of Charter School Statutes Leading to Model Legislation*. Santa Monica, CA: RAND.

Mintrom, Michael, and Sandra Vergari. 1997. "Charter Schools as a State Policy Innovation: Assessing Recent Developments." *State and Local Government Review* 29 (1): 43–49.

Miron, Gary. 2005. "Strong Charter School Laws Are Those That Result in Positive Outcomes." Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, April, http://www.wmich.edu/evalctr/charter/aera_2005_paper_charter_school_laws.pdf.

Molnar, Alex. 2001. "Calculating the Benefits and Costs of for-Profit Public Education." *Education Policy Analysis Archives* 9 (15), http://epaa.asu.edu/epaa/v9n15/.

Morse, Robert. 2007. "The Ranking Formula." *U.S. News and World Report*, November 29.

Nathan, Joe. 1994. *Charter Public Schools: A Brief History and Preliminary Lessons*. Minneapolis: Center for School Change, Hubert H. Humphrey Institute of Public Affairs.

Nathan, Joe. 1996a. *Charter Schools: Creating Hope and Opportunity for American Education*. San Francisco: Jossey-Bass.

Nathan, Joe. 1996b. "Progressives Should Support Charter Public Schools." *Rethinking Schools* 11:20–21.

Nathan, Joe. 2002. "Minnesota and the Charter Public School Idea." In *The Charter School Landscape*, ed. Sandra Vergari. Pittsburgh: Pittsburgh University Press.

National Center for Public Policy and Higher Education. 2004. *Measuring Up: The National Report Card on Higher Education*. San Jose, CA: National Center for Public Policy and Higher Education, http://measuringup.highereducation.org/_docs/2004/NationalReport_2004.pdf.

Orlofsky, Greg F., and Lynn Olson. 2001. "The State of the States." *Education Week*, January 11, http://www.edweek.org.

Appendix
Page 429

Palmer, Louann B., and Rebecca Gau. 2003. *Charter School Authorizing: Are States Making the Grade?* Washington, DC: Fordham Foundation.

Plank, David N., and Gary Sykes. 1999. "How Choice Changes the Education System: A Michigan Case Study." *International Review of Education* 45 (5–6): 406.

Pueblo Chieftain. 1998. "Pueblo Charter Schools Help State Rank High in Evaluations," December 28.

Rotherham, Andrew. 2007. "What Matters Most in Measuring." *U.S. News and World Report*, November 29.

Roy, Joydeep, and Laurence Mishel. 2005. "Re-examining Hoxby's Finding of Charter School Benefits." Briefing Paper 158, Economic Policy Institute, Washington, DC.

Sass, Tim R. 2006. "Charter Schools and Student Achievement in Florida." *Education Finance and Policy* 1 (1): 91–122.

Scott, Janelle T., and Margaret E. Barber. 2002. "Charter Schools in California, Michigan, and Arizona: An Alternative Framework for Policy Analysis." Occasional Paper 40, National Center for the Study of Privatization in Education, Teachers College, Columbia University.

Shanker, Albert. 1988. Untitled speech to the National Press Club, Washington, DC, March 31.

Smith, Stephen, John L. Myers, and Julie Underwood. 2003. "Blowing in the Wind: The Crisis in State Budgets Means School Funds Could Be Going, Going, Gone . . ." *American School Board Journal* 190 (5): 18–21.

U.S. Department of Education. 2004a. *The Nation's Report Card: America's Charter School Report (NCES 2005-456)*. Washington, DC: National Center for Education Statistics.

U.S. Department of Education. 2004b. *Title V, Part B: Non-regulatory Guidance*. Washington, DC: Charter Schools Program.

U.S. Government Accountability Office. 2005. *To Enhance Education's Monitoring and Research, More Charter School-Level Data Are Needed*. Washington, DC: U.S. Government Accountability Office.

Weiher, Gregory R., and Kent L. Tedin. 2002. "Does Choice Lead to Racially Distinctive Schools? Charter Schools and Household Preferences." *Journal of Policy Analysis and Management* 21 (1): 79–92.

Welner, Kevin G., and Kenneth R. Howe. 2005. "Steering toward Separation: The Policy and Legal Implications of 'Counseling' Special Education Students Away from Choice Schools." In *School Choice and Student Diversity: What the Evidence Says*, ed. Janelle Scott. New York: Teachers College Press.

Welner, Kevin G., and Alex Molnar. 2007. "Truthiness in Education." *Education Week*, February 28.

Witte, John F., Arnold F. Shober, and Paul Manna. 2003. "Analyzing State Charter Laws and Their Influence on the Formation of Charter Schools in the United States." Paper presented at the Annual Meeting of the American Political Science Association, Philadelphia, PA, August.

Wohlstetter, Priscilla, Richard Wenning, and Kerri L. Briggs. 1995. "Charter Schools in the United States: The Question of Autonomy." *Educational Policy* 9 (4): 331–58.

Wong, Kenneth K., and Francis X. Shen. 2001. "Institutional Effects of Charter Schools: Innovation and Stratification." Presented at the 82nd Annual Meeting of the American Educational Research Association, Seattle, WA, April.

F-4: FLORIDA CHARTER SCHOOL APPLICATION EVALUATION INSTRUMENT

Florida Charter School Application Evaluation Instrument

Each section presents criteria for a response that meets the standard, and these criteria should guide the overall rating for the section. The "Strengths" and "Concerns and Additional Questions" boxes provide space to identify data and other evidence that supports the rating. The rationale for each rating is important, especially if some of the data or evidence does not fit neatly into the criteria provided. If the data or evidence provided for a section raises a concern or question related to a specific statutory requirement, please list the statute in the "Reference" box in order to provide the most constructive feedback.

The following definitions should guide the ratings:

Meets the Standard: The response reflects a thorough understanding of key issues and demonstrates capacity to open and operate a quality charter school. It addresses the topic with specific and accurate information that shows thorough preparation and presents a clear, realistic picture of how the school expects to operate.

Partially Meets the Standard: The response addresses most of the criteria, but the responses lack meaningful detail and require important additional information.

Does Not Meet the Standard: The response lacks meaningful detail; demonstrates lack of preparation; or otherwise raises substantial concerns about the applicant's understanding of the issue in concept and/or ability to meet the requirement in practice.

OVERALL ASSESSMENT – COMPLETE THIS SECTION LAST

Would you recommend approval of this application for a public charter school? Explain your recommendation in the Summary Comments section below.

DENY	APPROVE
☐	☐

SUMMARY COMMENTS

SAMPLE

I. Educational Plan

The education plan should define what students will achieve, how they will achieve it, and how the school will evaluate performance. It should provide a clear picture of what a student who attends the school will experience in terms of educational climate, structure, assessment and outcomes.

1. Mission, Guiding Principles and Purpose

The Mission, Guiding Principles and Purpose section should indicate what the school intends to do, for whom and to what degree.

Statutory References:
ss. 1002.33(2)(a), 1002.33(2)(b), 1002.33(2)(c), 1002.33(6)(a)1., 1002.33(7)(a)1., F.S.

Evaluation Criteria:
A response that meets the standard will present:

- A compelling mission statement that defines the purpose and values of the school.
- A set of priorities that are meaningful, manageable and measurable, and focused on improving student outcomes.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

2. Target Population and Student Body

The Target Population and Student Body section should describe the anticipated target population of the school and explain how the school will be organized by grade structure, class size and total student enrollment over the term of the school's charter.

Statutory References:
ss. 1002.33(10)(e), 1002.33(6)(b)2., 1002.33(7)(a)1., 1003.03, F.S.

Evaluation Criteria:
A response that meets the standard will present:

- An understanding of the students the charter school intends to serve.
- A manageable plan tied to enrollment projections that will allow the school to meet its constitutional class size obligations.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

3. Educational Program Design

The Educational Program Design section should describe the educational foundation of the school and the teaching and learning strategies that will be employed.

Statutory Reference:
s. 1002.33(7)(a)2., F.S.

Evaluation Criteria:
A response that meets the standard will present an educational program design that:

- Is clear and coherent;
- Is based on effective, research-based educational practices, teaching methods and high standards for student learning;
- Aligns with the school's mission and responds to the needs of the school's target population; and
- Presents evidence that the proposed approach will lead to improved student performance for the school's target population.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

4. Curriculum Plan

The Curriculum Plan section should explain not only *what* the school will teach but also *how* and *why*.

Statutory References:
ss. 1002.33(6)(a)2., 1002.33(6)(a)4., 1002.33(7)(a)2., 1002.33(7)(a)4., F.S.

A response that meets the standard will present a curriculum plan that:

- Provides a clear and coherent framework for teaching and learning;
- Is research-based;
- Is consistent with the school's mission, educational philosophy and instructional approach;
- Will enable students to attain Next Generation Sunshine State Standards and receive a year's worth of learning for each year enrolled; and
- Will be appropriate for all students at all levels.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

5. Student Performance, Assessment and Evaluation

The Student Performance, Assessment and Evaluation section should define what students attending the school should know and be able to do, and reflect how the academic progress of individual students, cohorts over time, and the school as a whole will be measured.

Statutory References:
ss. 1002.33(6)(a)3., 1002.33(7)(a)3., 1002.33(7)(a)4., 1002.33(7)(a)5., F.S.

Evaluation Criteria:
A response that meets the standard will present:

- Measurable educational goals and objectives that set high standards for student performance.
- Promotion and graduation standards that are based on high expectations and provide clear criteria for promotion from one level to the next, and for graduation.
- Evidence that a range of valid and reliable assessment instruments will be used to measure student performance.
- Assessment activities that are sufficiently frequent and a detailed plan to determine whether students are making adequate progress.
- Evidence that student performance data will be sued to evaluate the effectiveness of educational programs and influence adjustments when necessary.
- Plans for sharing student performance information that will keep students and parents well informed of academic progress.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

6. Exceptional Students

The Exceptional Students section should demonstrate an understanding of the requirements of the school to serve all students and provide a concrete plan for meeting the broad spectrum of educational needs and providing all students with a quality education.

Statutory References:
ss. 1002.33(10)(f), 1002.33(16)(a)3., F.S.

Evaluation Criteria:
A response that meets the standard will present:

- Demonstrated understanding of state and federal requirements regarding the education of exceptional students.
- Demonstrated commitment to serving the full range of needs of exceptional students.
- Sound plans for educating exceptional students that reflect the full range of programs and services required to provide all students with a high quality education.
- Demonstrated capacity to meet the school's obligations under state and federal law regarding the education of exceptional students.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

7. English Language Learners

The English Language Learners section should demonstrate an understanding of the requirements of the school to serve English Language Learners and provide a concrete plan for meeting the broad spectrum of educational needs and providing all students with a quality education.

Statutory Reference:
s. 1002.33(16)(a)3., F.S.

Evaluation Criteria:
A response that meets the standard will present:

- Demonstrated understanding of state and federal requirements regarding the education of English Language Learners.
- Demonstrated commitment to serving the full range of needs of English Language Learners.
- Sound plans for educating English Language Learners that reflect the full range of programs and services required to provide all students with a high quality education.
- Demonstrated capacity to meet the school's obligations under state and federal law regarding the education of English Language Learners.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

8. School Climate and Discipline
The School Climate and Discipline section should describe the learning environment of the school and provide evidence that the school will ensure a safe environment conducive to learning.

Statutory References:
ss. 1002.33(7)(a)7., 1002.33(7)(a)11., 1002.33(9)(n), F.S.

Evaluation Criteria:
A response that meets the standard will present:

- A school calendar and schedule that support the mission and program requirements and meet the minimum statutory requirements.
- An approach to student discipline that creates and sustains a safe and orderly learning environment.
- Legally sound policies for student discipline, suspension, dismissal and recommendation for expulsion.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

II. Organizational Plan

The Organizational Plan should provide an understanding of how the school will be governed and managed. It should present a clear picture of the school's governance and management priorities, what responsibilities various groups and people will have, and how those groups will relate to one another.

9. Governance

The Governance section should describe how the policy-making and oversight function of the school will be structured and operate.

Statutory References:
ss. 1002.33(7)(a)15., 1002.33(12)(i), 1002.33(16)(b), F.S.

Evaluation Criteria:
A response that meets the standard will present:

- Documentation of proper legal structure of the governing board.
- Adequate policies and procedures for board operation.
- Evidence that the proposed governing board will contribute to the wide range of knowledge and skill needed to oversee a charter school.
- A clear, sensible delineation of roles and responsibilities in relation to governance and school management.
- A plan for the meaningful involvement of parents and the community in the governance of the school.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

10. Management

The Management section should describe how the day-to-day administration of the school's operations will be structured and fulfilled.

Statutory References:
ss. 1002.33(7)(a)9., 1002.33(7)(a)14., F.S.

Evaluation Criteria:
A response that meets the standard will present:

- A management structure that includes clear delineation of the roles and responsibilities for administering the day-to-day activities of the school.
- A sound plan for the recruitment, selection and evaluation of the school leader.
- A viable and adequate staffing plan.
- A sound plan for recruiting and retaining qualified and capable staff.

Meet the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

11. Education Service Providers
The term "education service provider" (ESP) refers to any number of organizations that contract with the governing board of a school to provide comprehensive services. The two major types of ESPs that serve charter schools are education management organizations and comprehensive school design providers. The Education Service Provider section should describe, if applicable, the contractual arrangement between the school's governing board and such a provider.

Statutory Reference:
s. 1002.33(7)(a)9., F.S.

Evaluation Criteria:
A response that meets the standard will present:

- A persuasive explanation of the reasons for contracting with an education service provider.
- A persuasive explanation that the proposed relationship with the ESP will further the school's mission and program.
- A clear description of the services to be provided by the ESP.
- A clear delineation of the roles and responsibilities between the school's governing board and the ESP.
- A clearly defined performance-based relationship between the school's governing board and the ESP.

Not Applicable	Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

12. Employment

The Employment section should define the policies and procedures that frame the school's relationship with its staff.

Statutory References:
ss. 1002.33(7)(a)14., 1002.33(12), F.S.

Evaluation Criteria:
A response that meets the standard will present:

- A compensation plan that will attract and retain quality staff.
- Policies and procedures that hold staff to high professional standards.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

13. Parent and Community Support and Partnerships

The Parent and Community Support and Partnerships section should describe how parents and the community will be engaged in the operations of the school.

Evaluation Criteria:
A response that meets the standard will present:

- Meaningful partnerships with parents and the community that further the school's mission and programs.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

14. Student Recruitment and Enrollment

The Student Recruitment and Enrollment section should describe how the school will attract and enroll its student body.

Statutory References:

ss. 1002.33(7)(a)7., 1002.33.(7)(a)8., 1002.33(10), F.S.

Evaluation Criteria:

A response that meets the standard will present:

- A student recruitment plan that will enable the school to attract its targeted population.
- An enrollment and admissions process that is open, fair, and in accordance with applicable law.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

III. Business Plan

The Business Plan should provide an understanding of how the charter operators intend to manage the school's finances. It should present a clear picture of the school's financial viability including the soundness of revenue projections; expenditure requirements; and how well the school's budget aligns with and supports effective implementation of the educational program.

15. Facilities

The Facilities section should provide an understanding of the school's anticipated facilities needs and how the school plans to meet those needs.

Statutory References:
ss. 1002.33(7)(a)13., 1002.33(18), F.S.

Evaluation Criteria:
A response that meets the standard will present:

- A realistic plan for securing a facility that is appropriate and adequate for the school's program and targeted population.
- Evidence that the school has access to the necessary resources to fund the facilities plan.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

16. Transportation Service

The Transportation Service section should describe how the school will address this service for its student body.

Statutory Reference:
s. 1002.33(20)(c), F.S.

Evaluation Criteria:
A response that meets the standard will present:

- A transportation plan that will serve all eligible students.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

17. Food Service

The Food Service section should describe how the school will address this service for its student body.

Statutory Reference:
s. 1002.33(20)(a), F.S.

Evaluation Criteria:
A response that meets the standard will present:

- A food service plan that will serve all eligible students.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

18. Budget

The Budget section should provide financial projections for the school over the term of its charter.

Statutory References:
ss. 1002.33(6)(a)5., 1002.33(6)(b)2., F.S.

Evaluation Criteria:
A response that meets the standard will present:

- Budgetary projections which are consistent with all parts of the application, including the school's mission, educational program, staffing plan and facility.
- A realistic assessment of the projected sources of revenue and expenses that ensure the financial viability of the school, including a realistic FTE projection.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

19. Financial Management and Oversight

The Financial Management and Oversight section should describe how the school's finances will be managed and who will be responsible for the protection of student and financial records.

Statutory References:
ss. 1002.33(6)(a)5., 1002.33(7)(a)9., 1002.33(7)(a)11., F.S.

Evaluation Criteria:
A response that meets the standard will present:

- A fiscal management system that is appropriate, follows generally accepted accounting principles and properly safeguards assets.
- Evidence of proper insurance coverage.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths

Concerns and Additional Questions	Reference

20. Action Plan

The Action Plan should provide a clear roadmap of the steps and strategies that will be employed to prepare the school to be ready to serve its students well on the first day of operation.

Statutory Reference:
s. 1002.33(7)(a)(16), F.S.

Evaluation Criteria:
A response that meets the standard will present an action plan that:

- Provides a thoughtful and realistic implementation plan that covers major operational items and provides flexibility for addressing unanticipated events.

Meets the Standard	Partially Meets the Standard	Does Not Meet the Standard
☐	☐	☐

Strengths	Reference

Concerns and Additional Questions	Reference

F-5 - CHARTER SCHOOL CLOSURES

DISTRICTNAME	SCHOOLNAME	DATE_CLOSED	Reason for Closure
ALACHUA	OASIS ENRICHMENT ACADEMY	11/1/2006	Financial Emergency
ALACHUA	MARTIN LUTHER KING ACADEMY	6/30/2007	Combined with another charter school
ALACHUA	DESOTO HIGH SCHOOL, INC.	6/30/2008	School chose not renew charter
ALACHUA	LOVE TO LEARN EDUCATIONAL CENTER	8/11/2008	School chose to close
BAY	TAPESTRY PARK CHARTER SCHOOL	10/11/2005	financial
BRADFORD	BELIEVER'S SCHOOL OF LEARNING	6/30/2007	Financial difficulty
BREVARD	RIVERS CHARTER ACADEMY	6/30/2005	Changed name to River's Edge Charter Academy in 2004 and then River's Edge changed its name to Imagine Schools at West Melbourne on 06/17/2008. Thomas Cole is the current principal of Imagine Schools at West Melbourne. Imagine Schools at West Melbourne is located at 3355 Imagine Way, West Melbourne, FL 32904 and their telephone number is 321-768-6200
BREVARD	STEPPING STONES CHARTER SCHOOL	6/30/2005	Changed name to River's Edge Charter Academy in 2004 (same info as above)
BREVARD	EXPLORER ELEMENTARY/MIDDLE CHARTER	4/10/2007	Financial - 2007 School Imploded
BREVARD	EINSTEIN MONTESSORI	6/30/2007	Chose not to renew their contract which ended 06/30/2007 - Einstein went Private
BREVARD	OAKWOOD ACADEMY	6/30/2007	Merged with Royal Palm 07/17/2007
BREVARD	OSPREY ELEMENTARY SCHOOL	8/28/2007	Financial - Contract terminated 08/29/2007
BREVARD	SAWGRASS ACADEMY	8/28/2007	Financial - Contract terminated 08/29/2007
BROWARD	N. LAUDERDALE ACADEMY HIGH SCHOOL	6/30/2005	Reconstituted because 2 Fs
BROWARD	NORTH LAUDERDALE ACADEMY HIGH SCHOOL	6/30/2006	financial - governing board action
BROWARD	EARLY BEGINNINGS ACADEMY WEST	6/30/2007	Low enrollment - governing board action
BROWARD	SMART SCHOOL INSTITUTE OF TECH/COM	6/30/2007	Reconstituted because 2 Fs
BROWARD	SUNSHINE ACADEMY CHARTER	6/30/2007	financial - governing board action
BROWARD	SMART SCHOOL INSTITUTE OF TECHNOLOGY AND COMMERCE	9/8/2008	academic performance - school board action
BROWARD	DOWNTOWN ACADEMY OF TECHNOLOGY & ARTS	9/19/2008	financial - governing board action
BROWARD	SUNRISE COMMUNITY CHARTER	2/3/2009	Threat to health, safety and welfare of students, etc.
BROWARD	SUSIE DANIEL CHARTER SCHOOL	7/21/2009	School Board Action
BROWARD	DAYSPRINGS ELEMENTARY	6/4/2009	Governing Board Action
DADE	A CHILD'S JOURNEY CHARTER SCHOOL	7/21/2008	Facility Issues - Lease terminated/academic performance
DADE	COOPERATIVE CHARTER SCHOOL	7/21/2008	Academic performance
DADE	EARLY BEGINNINGS ACADEMY-NORTH SHORE	6/30/2007	Merger/consolication into one charter - Early Beginnings Civic Center
DADE	EXCEL ACADEMY CHARTER SCHOOL	6/4/2009	Financial & Academic Performance

F-5 - CHARTER SCHOOL CLOSURES

DADE	EXCEL ACADEMY MIDDLE CHARTER SCHOOL	6/4/2009	Financial & Academic Performance
DADE	LIBERTY CITY CHARTER SCHOOL	7/21/2008	Severe Financial Emergency/inadequate insurance coverage/eviction
DADE	LIFE SKILLS CENTER-LIBERTY CITY AREA	2/3/2009	Facilities - Lease termination
DADE	NORTH COUNTY CHARTER SCHOOL	6/6/2005	SURRENDERED CHARTER
DADE	NORTH DADE COMMUNITY CHARTER	1/31/2005	SURRENDERED CHARTER
DADE	NORTHEAST ACADEMY	6/30/2005	SURRENDERED CHARTER
DADE	ROSA PARKS CHARTER SCHOOL	7/21/2008	Academic Performance
DADE	ROSA PARKS COMMUNITY - OVERTOWN	6/30/2005	Withdrew request for renewal
DADE	SPIRAL TECH ELEMENTARY CHARTER SCH	6/30/2006	90 DAY TERMINATION, financial
DADE	SPIRIT CITY ACADEMY	12/15/2008	IMMEDIATE TERMINATION, PRIOR TO END OF SCHOOL YEAR, academic & financial performance
DADE	SUNSHINE ACADEMY	6/30/2007	SURRENDERED CHARTER/Academic & Financial Performance/Management and Governance
DADE	TRANSITIONAL LEARNING ACADEMY	6/30/2007	SURRENDERED CHARTER/No longer feasible to maintain separate charter
DADE	TREE OF KNOWLEDGE ACADEMY	7/31/2009	SURRENDERED CHARTER/Financial Performance/Management/FTE Issues (Audit revealed overpayment)
DADE	VANKARA ACADEMY CHARTER SCHOOL	6/30/2005	NON-RENEWAL
DADE	TECHWORLD CHARTER SCHOOL	1/31/2001	TERMINATION, financial/academic management
DADE	BRIDGE ACADEMY	5/1/2005	REVOCATION PRIOR TO OPENING, non disclosure of background information
DUVAL	DESTINY EDUCATIONAL ACADEMY	7/8/2004	Academics
DUVAL	DANIEL PAYNE ACADEMY CHARTER	6/30/2005	Academics
DUVAL	HORIZONS UNLIMITED	6/30/2005	Academics
DUVAL	SCHOOL OF SUCCESS ACADEMY CHARTER HIGH SCHOOL	6/30/2006	Academics
DUVAL	SOJOURNER TRUTH HIGH SCHOOL	6/30/2006	Academics/Financial
DUVAL	KREATIVE KIDS CHARTER	6/30/2004	Two failing grades & financial problems
ESCAMBIA	LIFE SKILLS CENTER	6/30/2008	Management company terminated contract with the school's governing body
ESCAMBIA	RUBY J. GAINER CHARTER SCHOOL	5/29/2009	Financial
HIGHLANDS	HOPEWELL ACADEMY	4/7/2008	Financial

F-5 - CHARTER SCHOOL CLOSURES

HILLSBOROUGH	EASTSIDE MULTICULTURAL CHARTER SCHOOL	6/30/2004	student achievement
HILLSBOROUGH	CENTRAL CITY ELEMENTARY OF TAMPA	6/30/2005	student achievement
HILLSBOROUGH	NORTH TAMPA ALTERNATIVE CHARTER SCHOOL	6/30/2005	school chose to close due to financial matters
HILLSBOROUGH	TAMPA UNITED METHODIST	6/30/2005	student achievement
HILLSBOROUGH	WILBESAN ACADEMY	6/30/2005	student health and safety
HILLSBOROUGH	RICHARD MILBURN ACADEMY	6/30/2006	student achievement, FTE inaccuracies leading to financial concerns
HILLSBOROUGH	PRINCE ACADEMY	6/30/2008	academics, financial, board governance,student health/safety
HILLSBOROUGH	USF/PATEL INTERMEDIATE CHARTER SCHOOL	6/30/2008	student achievement
HILLSBOROUGH	USF/PATEL PRIMARY CHARTER SCHOOL	6/30/2008	student achievement
HILLSBOROUGH	METROPOLITAN MINISTRIES	6/9/2009	School requested termination due to poor student achievement
HILLSBOROUGH	CARL SAGAN ACADEMY	7/14/2009	school requested non-renewal due to poor student achievement & ESE issues
HILLSBOROUGH	ANDERSON ACADEMY	7/14/2009	School requested termination due to poor student achievement, ESE issues, and financial issues
HILLSBOROUGH	REBIRTH ACADEMY	7/28/2009	school board voted to non-renew contract due to poor student achievement
HILLSBOROUGH	TAYLOR PEACE ACADEMY	7/28/2009	school board voted to non-renew contract due to fiscal mismanagement, never opened
INDIAN RIVER	INDIAN RIVER ACADEMY	12/22/2005	Financial and enrollment
JACKSON	CHALLENGE FOR SUCCESS	6/30/2005	cheating on FCAT, did not pay bills to vendors, contract was not renewed
LAKE	MILESTONES COMMUNITY MIDDLE	6/30/2005	Merged
LAKE	MILESTONES COMMUNITY SCHOOL	6/30/2005	Merged
LAKE	RIVENDELL ACADEMY	8/4/2008	no longer had a management company and requested a termination of their charter contract
LAKE	NATIONAL DEAF ACADEMY	7/1/2009	opted to become a private school and not renew their charter
LEE	BRIGHT SCHOLARS ACADEMY	12/9/2008	financial failure
LEVY	NEW HOPE CHARTER SCHOOL	5/26/2006	financial
MANATEE	ISLAND MIDDLE SCHOOL, INC.	6/30/2005	overturn in leadership
MANATEE	MANATEE CO. JUVENILE JUSTICE	6/30/2006	moved the program
MANATEE	PAL OPPORTUNITY CHARTER SCHOOL	6/30/2009	School chose not renew charter
MARION	FUTURE LEADERS ACADEMY FOR ARTS AND SCIENCE	6/30/2005	Financial and academic

F-5 - CHARTER SCHOOL CLOSURES

ORANGE	KOTA CHARTER SCHOOL	never opened	Never opened. Application approved but never went to contract
ORANGE	MESTA CHARTER	2/1/2004	Good Cause
ORANGE	ORIGINS MONTESSORI CHARTER	6/30/2007	Contract non-renewed due to lack of financial oversight
ORANGE	SUMMIT CHARTER WEST	6/30/2007	Contract non-renewed at request of charter school
ORANGE	SUMMIT CHARTER CENTRAL	6/30/2008	Non-renewed at request of charter school
ORANGE	WESTMINSTER ACADEMY CHARTER	6/30/2008	closed at request of charter school
OSCEOLA	ARTHUR J. GALLAGHER NEIGHBORHOOD SCHOOL, INC.	6/30/2006	The Charter School Board of Directors cancelled their contract with the School Board of Osceola County
OSCEOLA	CANOE CREEK MIDDLE ACEDEMY	6/30/2006	Canoe Creek Middle Academy merged with Canoe Creek Charter Academy for the 2006-2007 school year, serving K-8 students
OSCEOLA	FOUNDATION MIDDLE ACADEMY	6/30/2006	Foundation Middle Academy merged with P.M. Wells Charter Academy for the 2006-2007 school year, serving K-8 students
OSCEOLA	FOUR CORNERS CHARTER MIDDLE	6/30/2006	Four Corners Charter Middle merged with Four Corners Charter School for the 2006-2007 school year, serving K-8 students
OSCEOLA	KENANSVILLE CHARTER ELEMENTARY	10/31/2006	Charter School requested to close the school based upon specific facility safety issues.
OSCEOLA	KENANSVILLE CHARTER MIDDLE SCHOOL	10/31/2006	Charter School requested to close the school based upon specific facility safety issues.
PALM BEACH	ACADEMIC SCHOOL FOR THE ARTS	6/30/2005	School requested closure due to financial difficulties
PALM BEACH	TERRANOVA CHARTER SCHOOL	6/30/2005	School requested closure due to financial difficulties
PALM BEACH	SPANISH ACADEMY CHARTER SCHOOL	1/1/2006	School requested closure due to financial difficulties
PALM BEACH	COREBRIDGE EDUCATIONAL ACADEMY	6/30/2006	School requested closure due to financial difficulties
PALM BEACH	DELRAY BOYNTON ACADEMY	6/30/2006	School was turned over to an Alternative School
PALM BEACH	RIVIERA BEACH CHARTER SCHOOL	6/30/2006	School was turned over to an Alternative School
PALM BEACH	PALM BEACH MILITARY ACADEMY	10/24/2006	School requested closure due to lack of teachers
PALM BEACH	GOOD SCHOOLS FOR ALL LEADERSHIP ACADEMY	6/30/2007	The governing board requested closure
PALM BEACH	GULF STREAM GOODWILL CAREER ACADEMY	6/30/2007	School requested closure to focus on ESE Programs for the other two (2) charter schools they have
PALM BEACH	MONTESSORI ACADEMY OF NORTHERN PALM BEACH	6/30/2007	School requested closure due to financial difficulties
PALM BEACH	THE IMAGINE SCHOOL	6/30/2007	School requested withdrawl of the renewal application
PALM BEACH	ACADEMY OF INTERNATIONAL STUDIES	7/1/2008	School merged with Bright Futures International

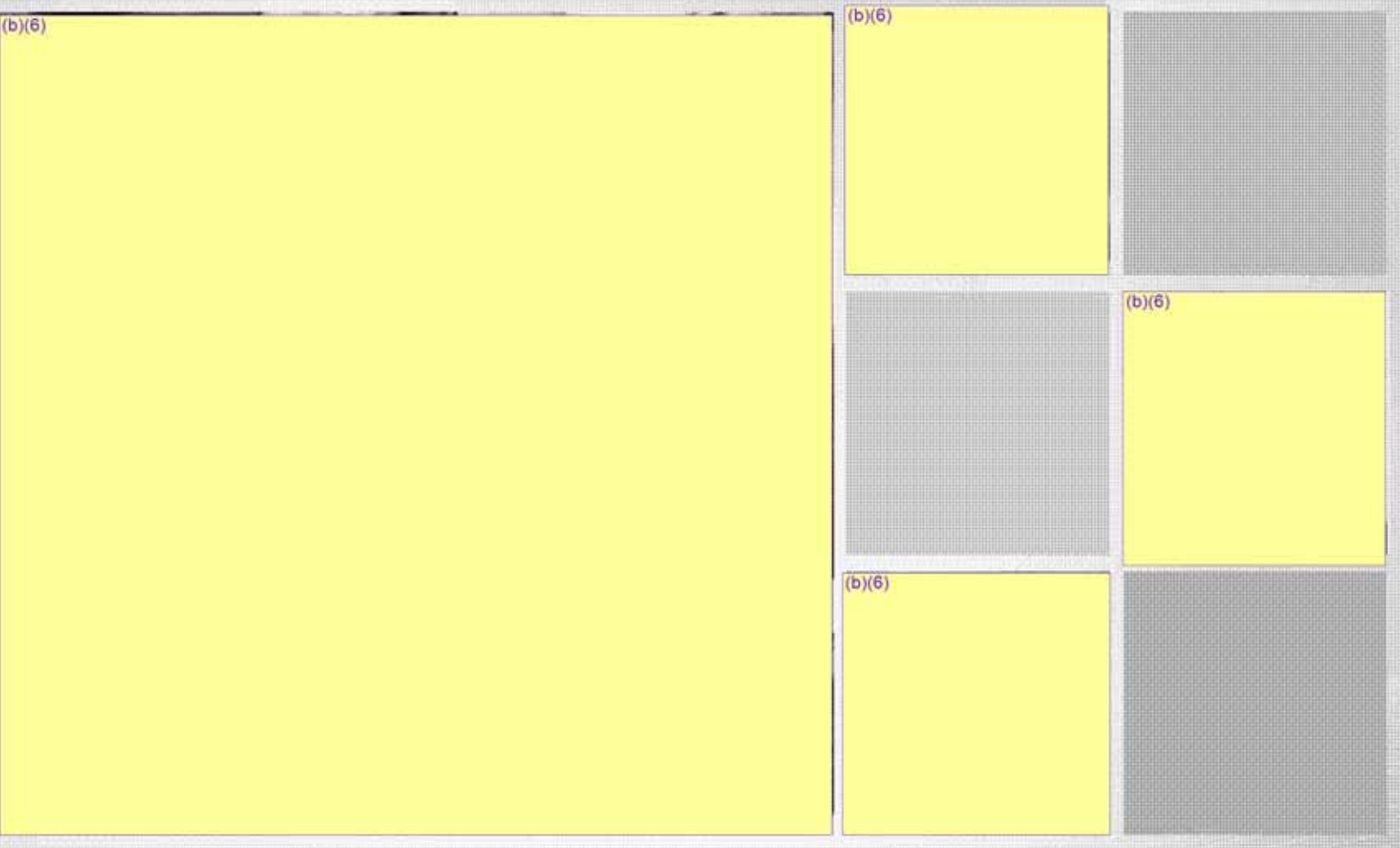
F-5 - CHARTER SCHOOL CLOSURES

PALM BEACH	GULFSTREAM TRANSITION ACADEMY	9/17/2008	School merged with Gulfstream Goodwill L.I.F.E.
PASCO	INFINITY SCHOOL OF PERFORMING ARTS	never opened	School did not open.
PASCO	THE LANGUAGE ACADEMY	6/29/2007	Financial - EMO closed school just prior to district renewal decision not to renew.
PASCO	RICHARD MILBURN ACADEMY	6/30/2007	Financial due to low enrollment
POLK	ACADEMIC REASEARCH CENTER (ARC)	6/30/2005	Academic- State Board of Education Ruling
POLK	THE OAKS MIDDLE ACADEMY	6/30/2005	Other reasons- Governing Board decision
POLK	ARC - ACADEMIC RESEARCH CENTER	8/1/2005	Academic- State Board of Education Ruling
POLK	BARTOW CHARTER SCHOOL	8/1/2005	Academic- State Board of Education Ruling
POLK	HAINES CITY LITERARCY LEARNING ACADEMY	5/4/2006	Other reasons- Governing Board decision
POLK	THE APPLE SCHOOL	5/23/2006	Other reasons- Governing Board decision
POLK	BENNETT CHRISTIANSEN ACADEMY	6/30/2006	Other reasons- Governing Board decision
POLK	S.T.A.R. CHARTER SCHOOL	5/22/2007	Other reasons- Non-Renewasl of Charter Contract with Sponsor
POLK	FOUNDATION SCHOOL	6/30/2009	Other reasons- Governing Board decision
POLK	LIFE SKILLS CENTER	6/30/2009	Other reasons- Non-Renewasl of Charter Contract with Sponsor
SARASOTA	WINGS ACADEMY	6/30/2005	Never opened
SARASOTA	CHANCELLOR CHARTER SCHOOL AT SARASOTA	6/30/2006	Financial
SARASOTA	RICHARD MILBURN ACADEMY OF FLORIDA	6/30/2006	Academic
SARASOTA	SARASOTA COMMUNITY SCHOOL FOR EXCELLENCE	never opened	Never opened
SARASOTA	GOODWILL ACADEMY	6/30/2008	Academic, financial
ST. JOHNS	FIRST COAST SKILLS ACADEMY	8/30/2004	closed voluntarily
ST. JOHNS	FIRST COAST TECHNICAL HIGH SCHOOL	8/30/2004	closed voluntarily
ST. JOHNS	LOVE TO LEARN ACADEMY	6/30/2005	closed by district
SUMTER	THE VILLAGES CHARTER HIGH	6/30/2007	Merged with 2001
SUMTER	VILLAGES CHARTER MIDDLE SCHOOL	6/30/2007	Merged with 2001
VOLUSIA	EASTER SEALS CHILD DEVELOPMENT CENTER-DELTONA	6/30/2006	Lack of affordable space
VOLUSIA	EASTER SEALS CHILD DEVELOPMENT CENTER, DELAND	6/30/2009	Easter Seals has one contract with 2 sites. This is not the main site

F-6: 2008-2009 CHARTER SCHOOL STUDENT ACHIEVEMENT REPORT-DATA

Student Achievement in Florida's Charter Schools:

A Comparison with Achievement in Traditional Public Schools



FLORIDA DEPARTMENT OF EDUCATION

Improving K-12 Educational Choice Options

About This Report

Section 1002.33(23), Florida Statutes, requires the Florida Department of Education to prepare an annual statewide analysis of student achievement in charter schools versus the achievement of comparable students in traditional public schools. This report of charter school student performance fulfills the statutory requirement for the 2008-09 school year. The analysis examines the average performance of charter school students and traditional public school students using eight years of Florida Comprehensive Assessment Test (FCAT) reading and math test scores, as well as the FCAT science test scores that were added to the school grading calculation in 2007-08. Only students who were enrolled in a charter school or a traditional public school for an entire school year are included in the analysis. Limiting the analysis to include only full-year students is consistent with the state's school accountability system for awarding school grades under the A+ Plan. In addition, the report compares charter and traditional public schools in terms of achievement gaps and student learning gains.

The analysis and production of this report was a coordinated effort between the Office of Independent Education and Parental Choice and the Bureau of Research and Evaluation in the Division of Accountability, Research, and Measurement. Additional information about charter schools and other school choice options is available on the Department's Web site at: www.floridaschoolchoice.org.

> **Section 1002.33(23)**, *Florida Statutes (23) ANALYSIS OF CHARTER SCHOOL PERFORMANCE.--Upon receipt of the annual report required by paragraph (9)(l), the Department of Education shall provide to the State Board of Education, the Commissioner of Education, the Governor, the President of the Senate, and the Speaker of the House of Representatives an analysis and comparison of the overall performance of charter school students, to include all students whose scores are counted as part of the statewide assessment program, versus comparable public school students in the district as determined by the statewide assessment program currently administered in the school district, and other assessments administered pursuant to s. 1008.22(3).*

FLORIDA'S CHARTER Schools

Table of Contents

Overview 1
Demographics 2
School Grades 3
FCAT Reading: 2002-2009 4
FCAT Reading: Subgroup Comparisons 5
FCAT Math: 2002-2009 8
FCAT Math: Subgroup Comparisons 9
FCAT Science: 2009 12
FCAT Science: Subgroup Comparisons 12
Achievement Gap: Reading 2002-2009 15
Achievement Gap: Math 2002-2009 18
Achievement Gap: Summary 2009 21
DSS Learning Gains 2009 24
Key Achievement Findings 25
Data 2008-2009 26

(b)(6)

Student Achievement in Florida's Charter Schools: A Comparison with Achievement in Traditional Public Schools

Charter schools are independent public schools created on the basis of an agreement between a group of school organizers and a sponsoring body. Florida's charter schools have been growing by near record numbers since the first five charter schools were opened in 1996. During the 2008-09 school year, 389 operated throughout the state in 42 school districts and at two state universities. While each charter school is unique in its educational approach, charter schools are generally classified as start-up schools, schools managed by educational management organizations, conversion public schools, community partnerships, or University charter lab schools. Each charter school has its own governing board that is responsible for setting policies and procedures. Charter schools have flexibility in providing expanded learning experiences to meet students' individual educational needs by using innovative learning methods. In return, they are held accountable for achieving results. Although provided more freedom than traditional public schools, charter schools are held accountable on multiple levels. The charter contract delineates expectations of the governing board and the sponsor regarding the school's academic and financial performance. As part of their contract, charter schools are held accountable for academic and financial results, embodied in the following three guiding principles:

- Meet high standards of student achievement while providing parents flexibility to choose among diverse educational opportunities within the state's public school system;
- Promote enhanced academic success and financial efficiency by aligning responsibility with accountability; and
- Provide parents with sufficient information on whether or not the child gains at least a year's worth of learning for every year spent in the charter school.

Students Served by Florida Charter Schools

Charter schools provide parents with additional choices for selecting the most effective educational programs for their children and offer creative solutions for improving student achievement in Florida. The charter school movement in Florida began as an avenue to improve student learning, increase parental choice, influence the traditional public school system, and foster innovative instructional practices. Charter school enrollment has grown steadily over the last decade. As shown below, charter schools served 118,000 students in the 2008-09 school year, which translates to more than 4.5% of Florida's total public school population. Of these students, males and females each made up 50% of the population. Approximately 59% of charter school students were minorities compared to 54% of traditional public school students. Charter schools had a lower percentage of students who qualified for free and reduced price lunch. In addition, charter schools served a smaller proportion of students with disabilities than traditional public schools.

2008-09 Charter School and Traditional School Student Populations

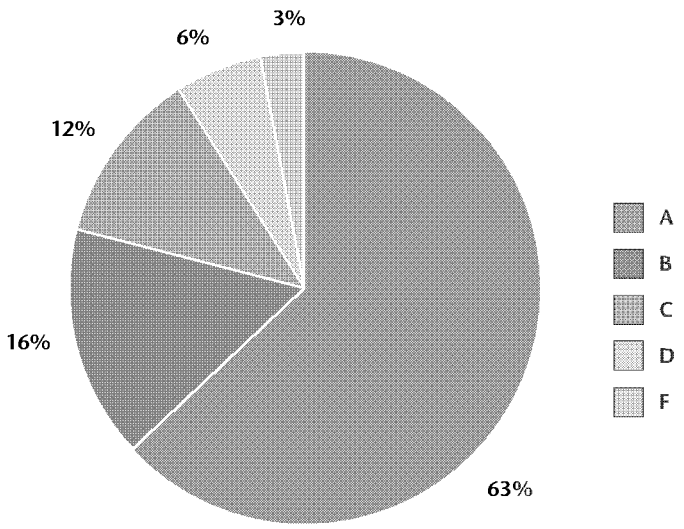
	Charter	Traditional
Student Membership	118,058	2,552,937
Gender		
Male	50%	48%
Female	50%	52%
Race		
White	41%	46%
African American	22%	23%
Hispanic	31%	25%
Asian	2%	2%
American Indian	0.4%	0.3%
Multi-Racial	4%	4%
Free and Reduced Lunch Eligible	38%	49%
Exceptional Student Education	10.8%	14.2%

Grading Charter Schools

Like traditional public schools, charter schools are assigned a performance grade if they meet the eligibility criteria and are not an alternative school. Changes to the school grade calculations in 2002-03 resulted in an increased number of charter schools receiving performance grades. The percentage of charter schools receiving an "A" has increased from 42% in 2002-03 to 63% in 2008-09. Conversely, the percentage of "F" charter schools has decreased to 3% in 2008-09 from 16% in 2002-03.

YEAR	A	B	C	D	F
2002-03	42%	11%	18%	13%	16%
2003-04	38%	11%	24%	13%	14%
2004-05	36%	15%	22%	14%	12%
2005-06	50%	20%	21%	6%	3%
2006-07	48%	21%	19%	8%	5%
2007-08	52%	20%	19%	4%	5%
2008-09	63%	16%	12%	6%	3%

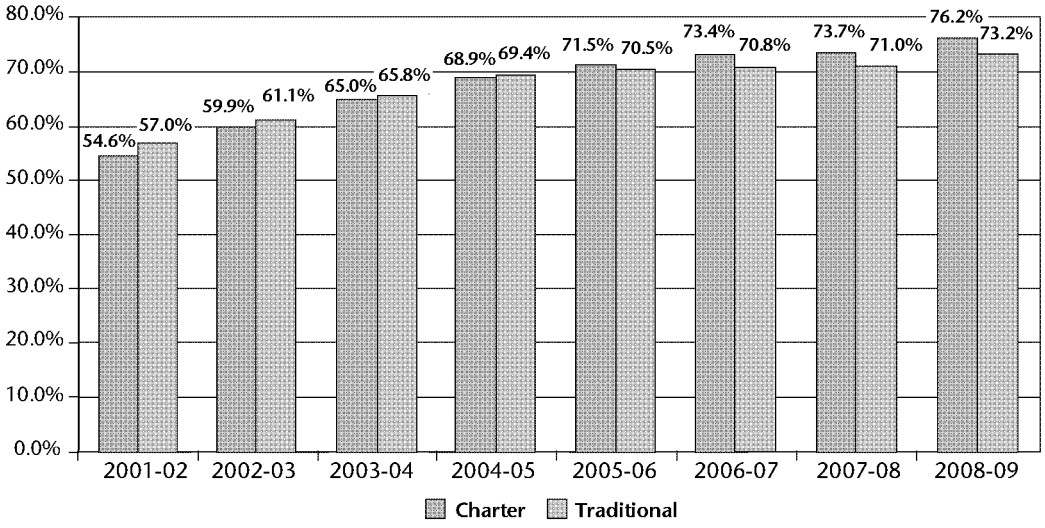
2009 Charter School Performance Grades



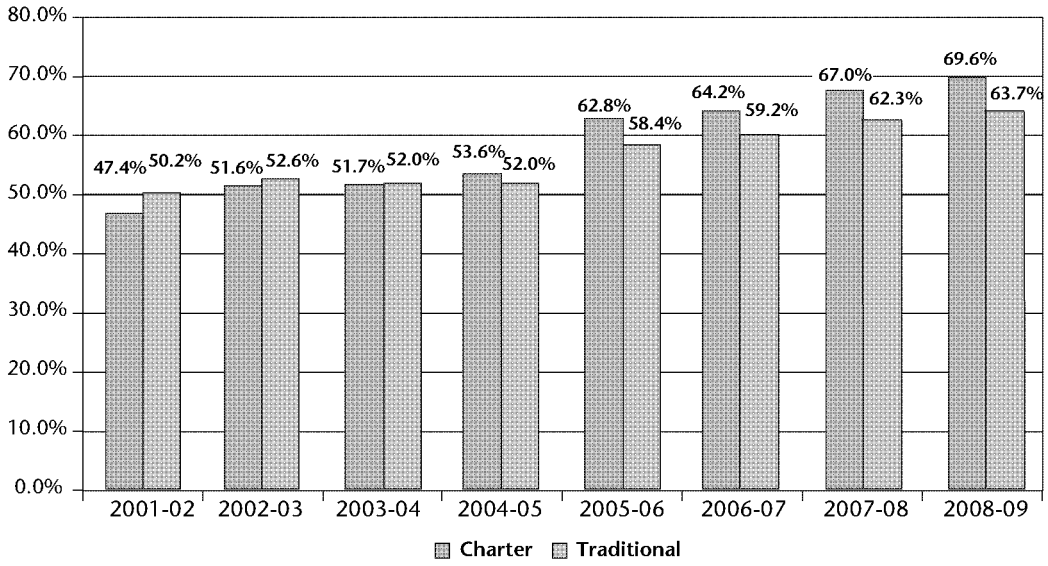
Reading

FCAT Reading
Traditional Public Schools and Charter Schools
2002-2009

Percent of Students Scoring at Level 3 or Above on FCAT Reading
Elementary School Grades 3, 4, and 5
Charter Schools and Traditional Public Schools, 2002 to 2009

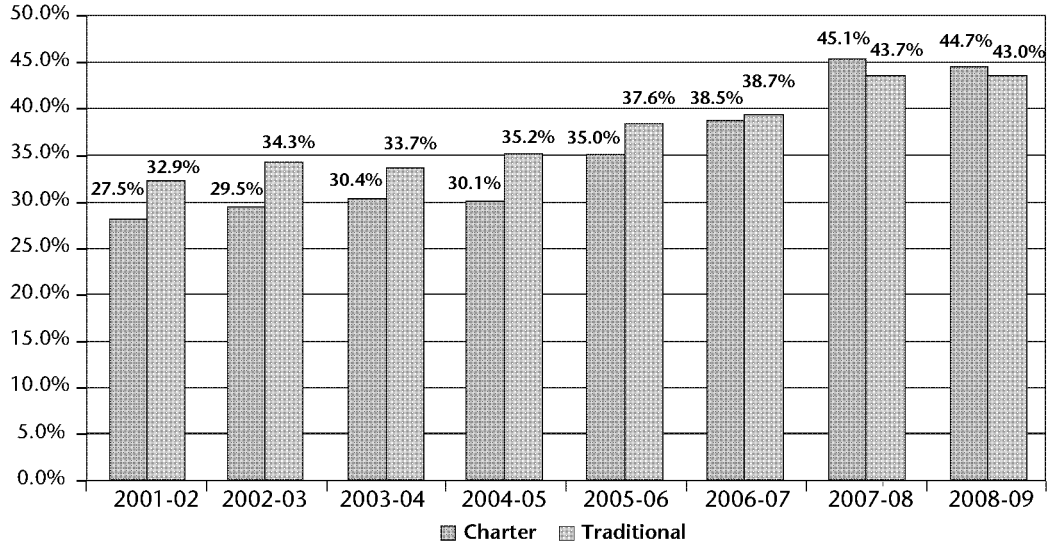


Percent of Students Scoring at Level 3 or Above on FCAT Reading
Middle School Grades 6, 7, and 8
Charter Schools and Traditional Public Schools, 2002 to 2009



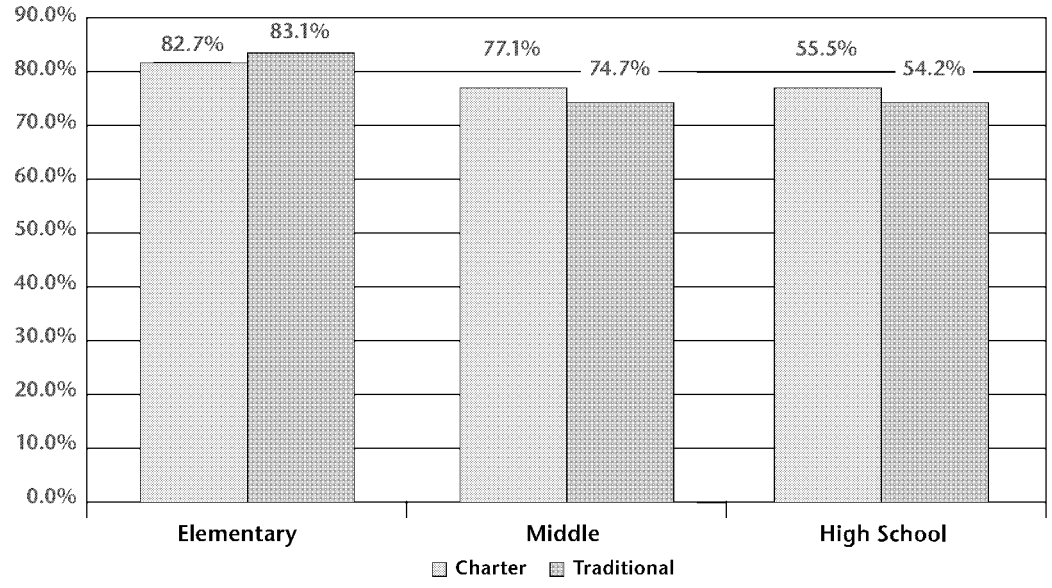
Reading

Percent of Students Scoring at Level 3 or Above on FCAT Reading
High School Grades 9 and 10
Charter Schools and Traditional Public Schools, 2002 to 2009



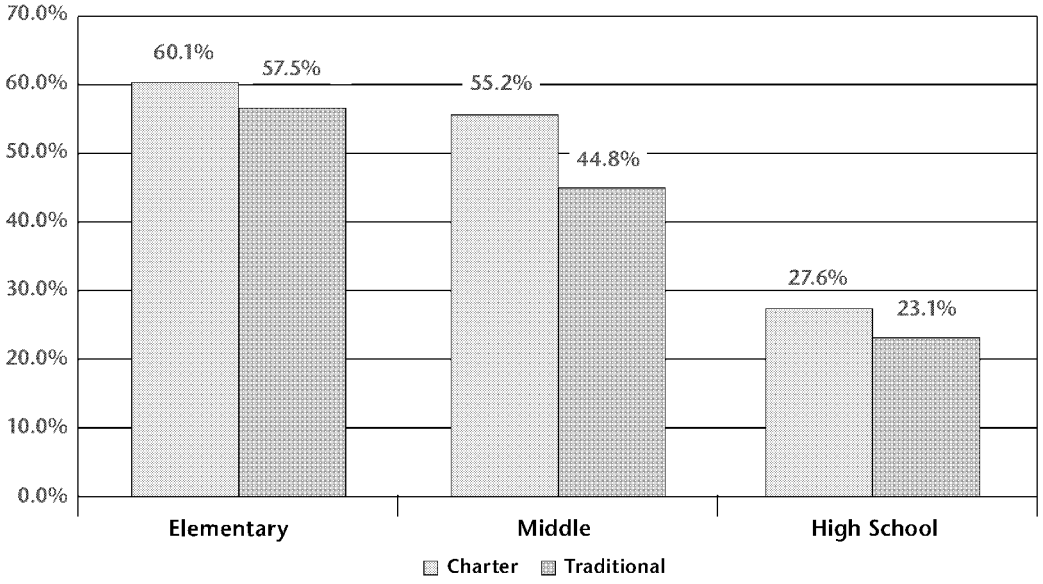
FCAT Reading
Traditional Public Schools and Charter Schools
SUB-GROUP COMPARISONS 2009

Percent of Students Scoring a Level 3 or Above on FCAT Reading
Charter Schools and Traditional Public Schools
White Students

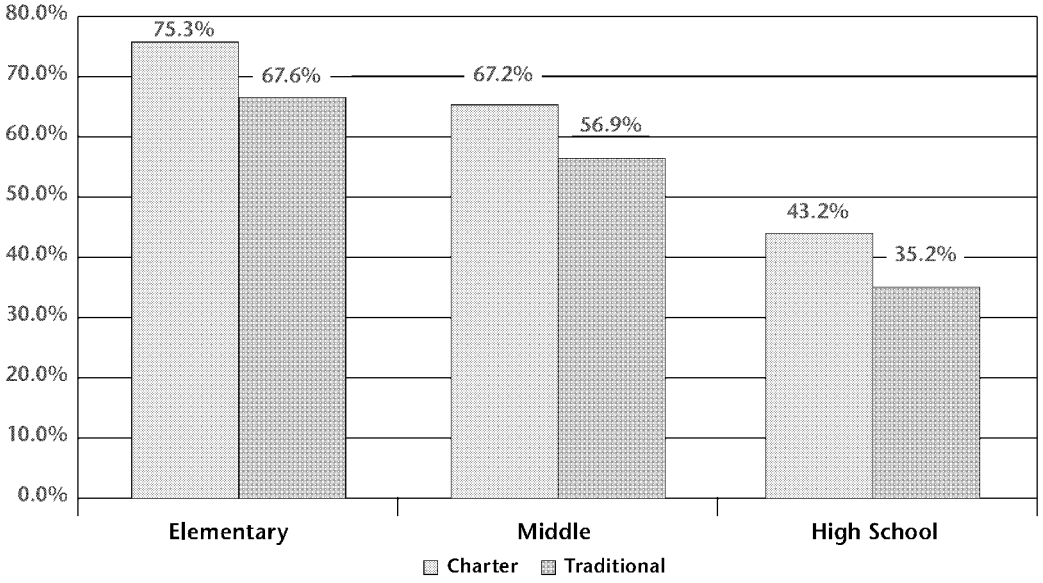


Reading

Percent of Students Scoring a Level 3 or Above on FCAT Reading
Charter Schools and Traditional Public Schools
African-American Students

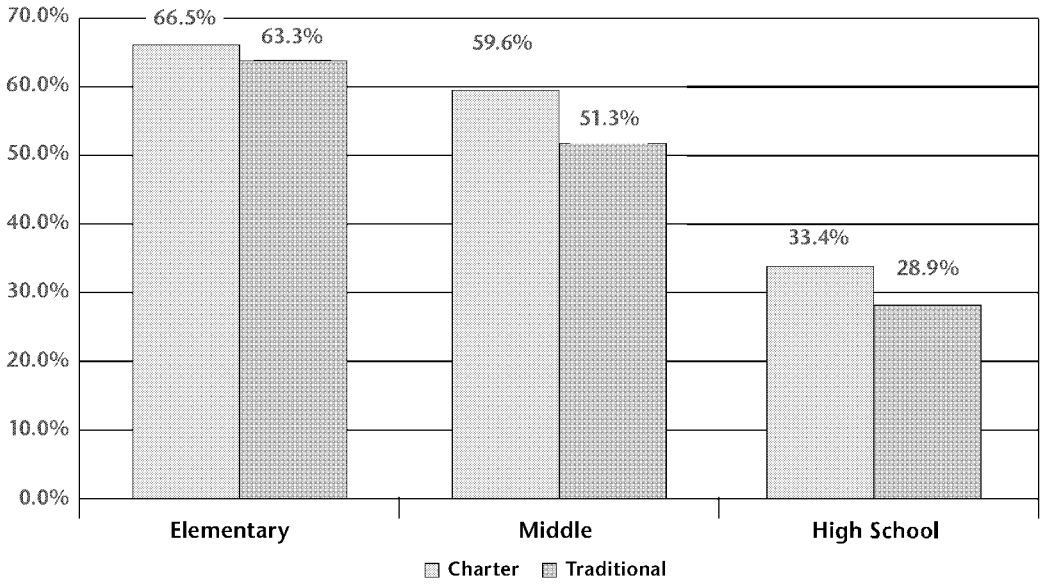


Percent of Students Scoring a Level 3 or Above on FCAT Reading
Charter Schools and Traditional Public Schools
Hispanic Students

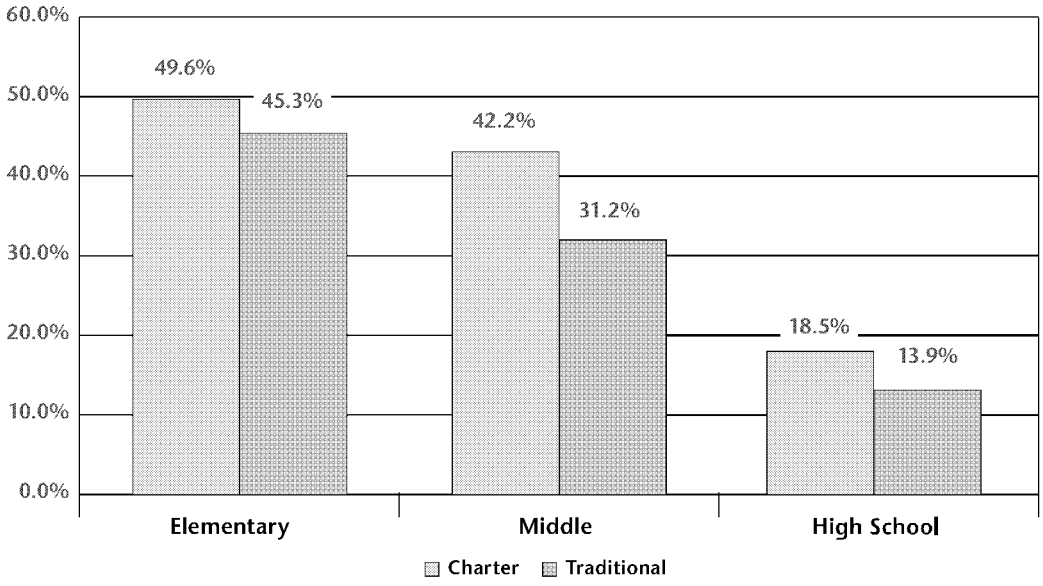


Reading

Percent of Students Scoring a Level 3 or Above on FCAT Reading
Charter Schools and Traditional Public Schools
Free and Reduced Lunch (FRL)



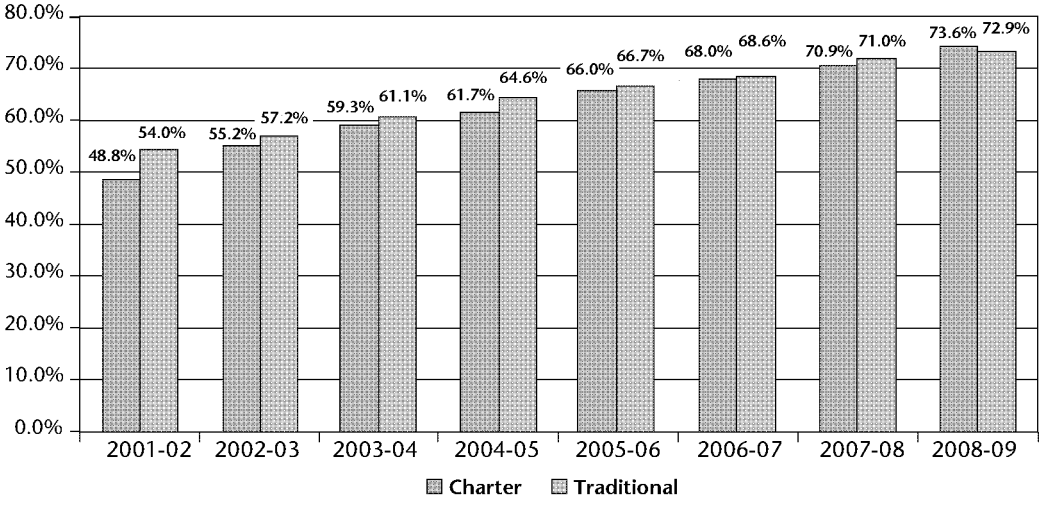
Percent of Students Scoring a Level 3 or Above on FCAT Reading
Charter Schools and Traditional Public Schools
Exceptional Education Students



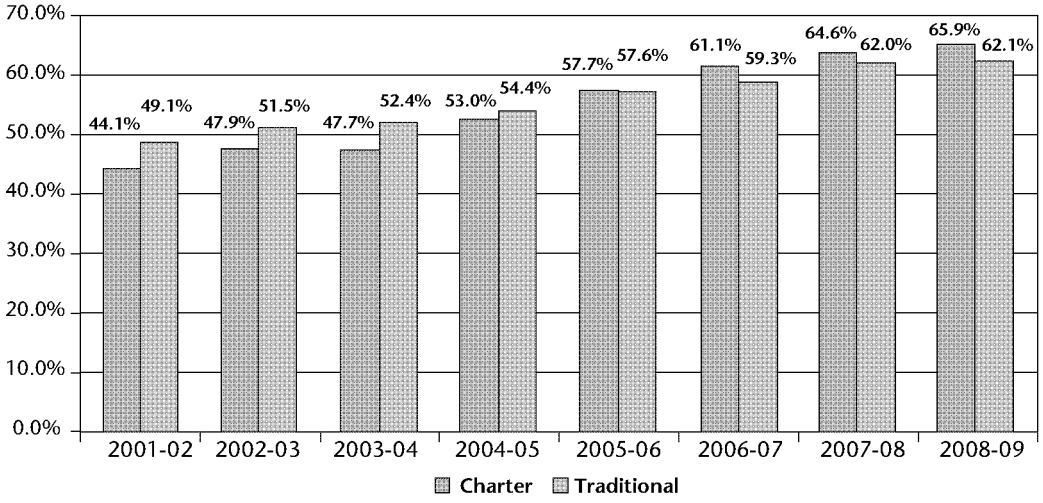
Math

FCAT Math
Traditional Public Schools and Charter Schools
2002-2009

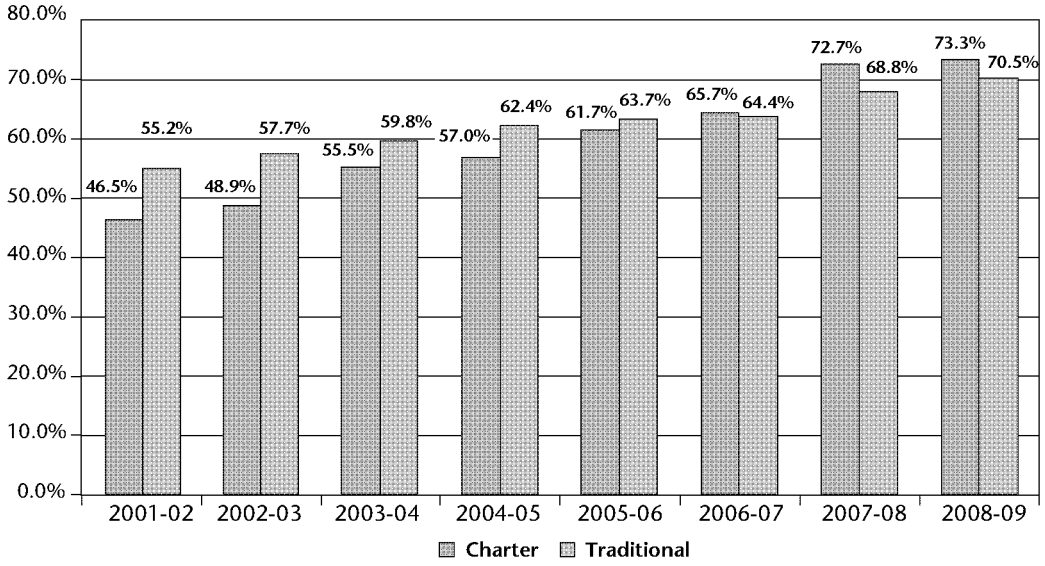
Percent of Students Scoring at Level 3 or Above on FCAT Math
Elementary School Grades 3, 4, and 5
Charter Schools and Traditional Public Schools, 2002 to 2009



Percent of Students Scoring at Level 3 or Above on FCAT Math
Middle School Grades 6, 7, and 8
Charter Schools and Traditional Public Schools, 2002 to 2009



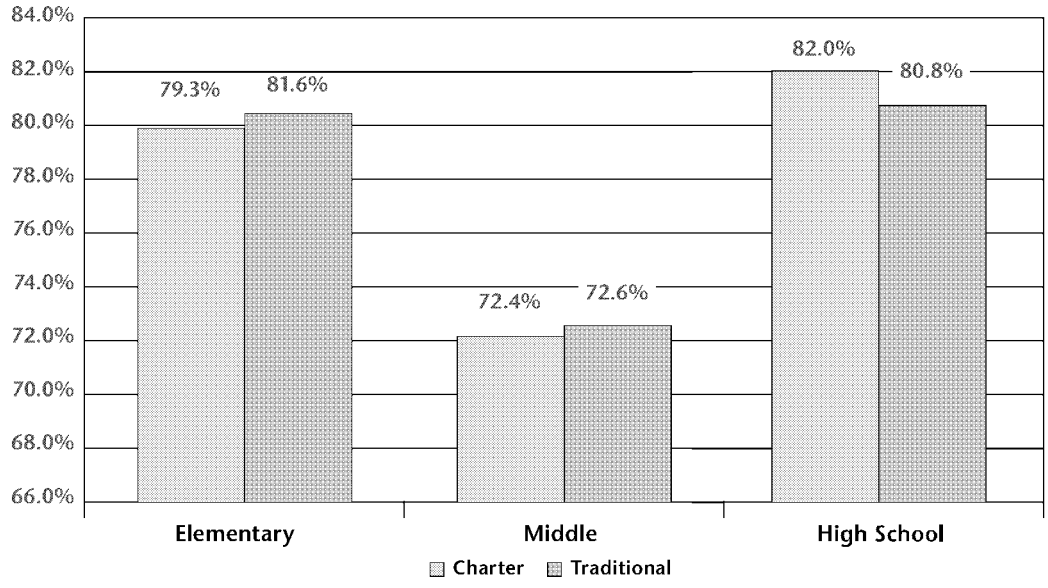
Percent of Students Scoring at Level 3 or Above on FCAT Math
High School Grades 9 and 10
Charter Schools and Traditional Public Schools, 2002 to 2009



FCAT Math
Traditional Public Schools and Charter Schools

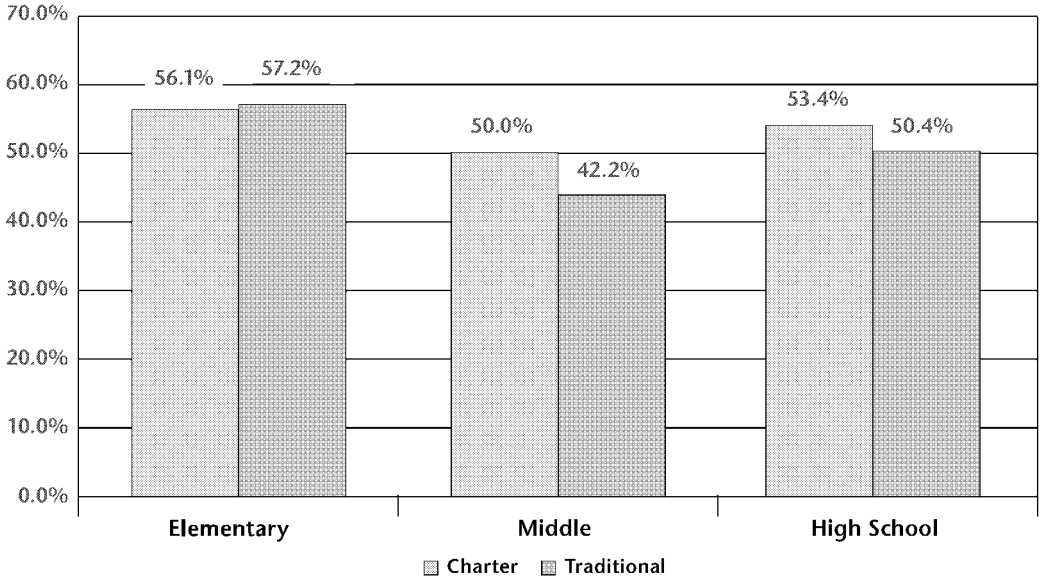
SUB-GROUP COMPARISONS 2009

Percent of Students Scoring a Level 3 or Above on FCAT Math
Charter Schools and Traditional Public Schools
White Students

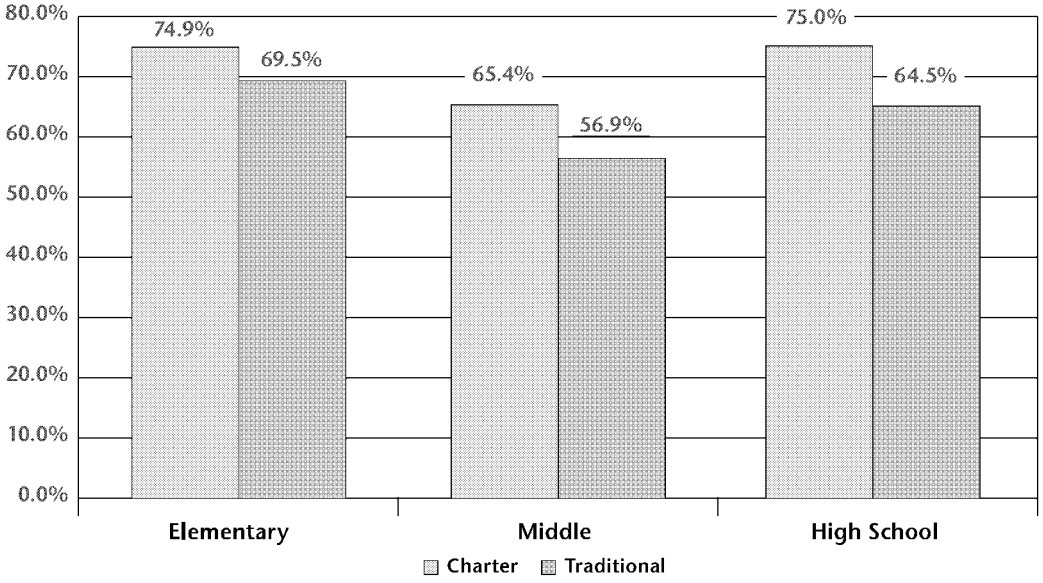


Math

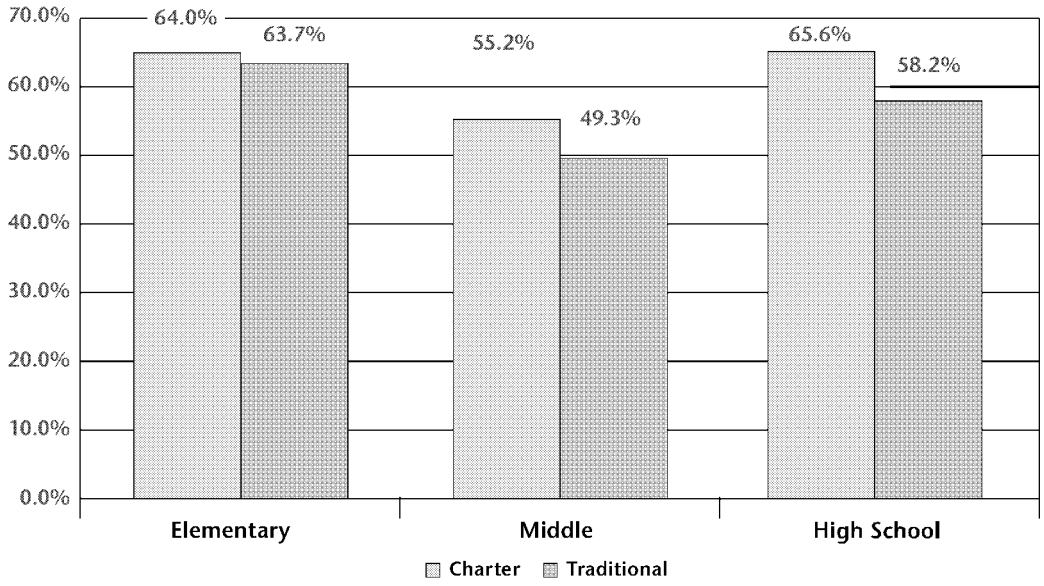
Percent of Students Scoring a Level 3 or Above on FCAT Math
Charter Schools and Traditional Public Schools
African-American Students



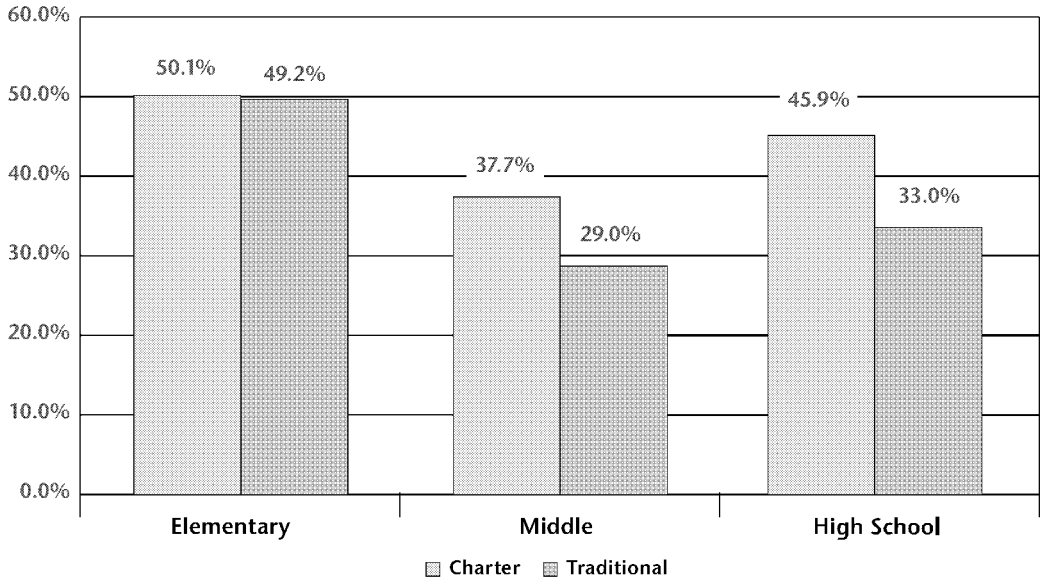
Percent of Students Scoring a Level 3 or Above on FCAT Math
Charter Schools and Traditional Public Schools
Hispanic Students



Percent of Students Scoring a Level 3 or Above on FCAT Math
Charter Schools and Traditional Public Schools
FRL Students



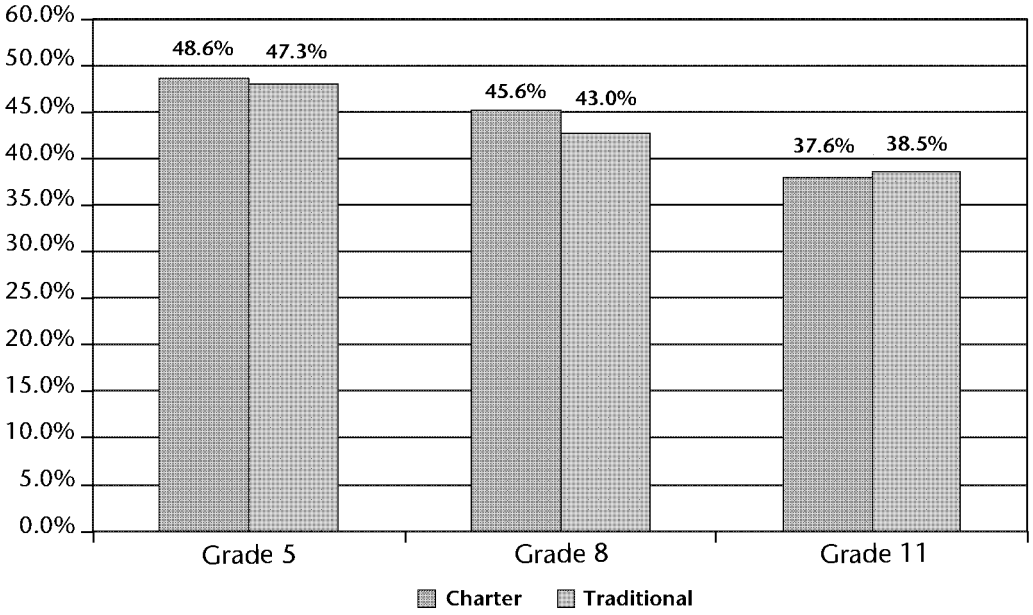
Percent of Students Scoring a Level 3 or Above on FCAT Math
Charter Schools and Traditional Public Schools
Exceptional Education Students



Science

FCAT Science
Traditional Public Schools and Charter Schools
2009

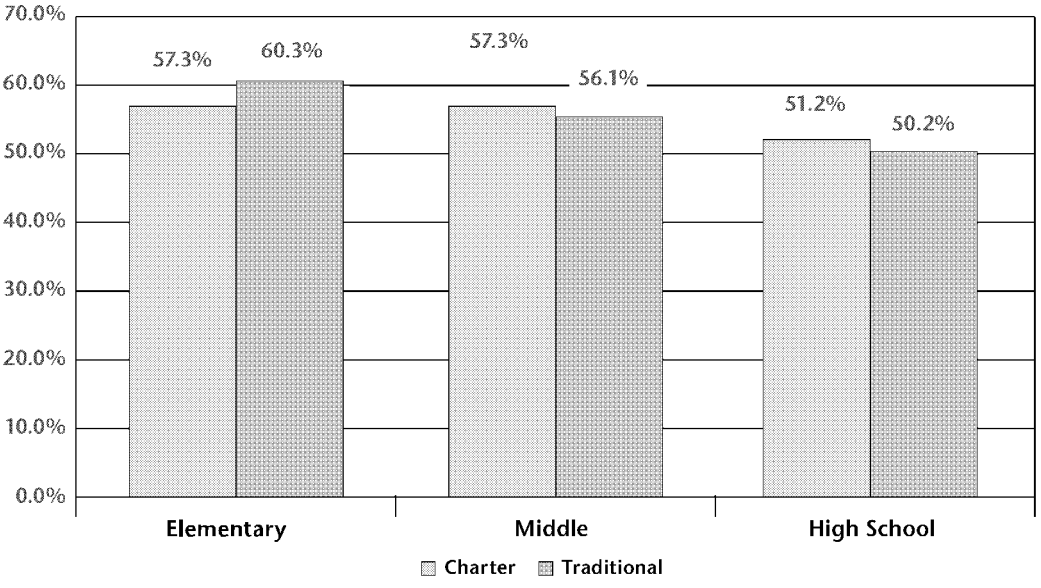
Percent of Students Scoring a Level 3 or Above on FCAT Science
Grades 5, 8, and 11
Charter Schools and Traditional Public Schools



FCAT Science
Traditional Public Schools and Charter Schools

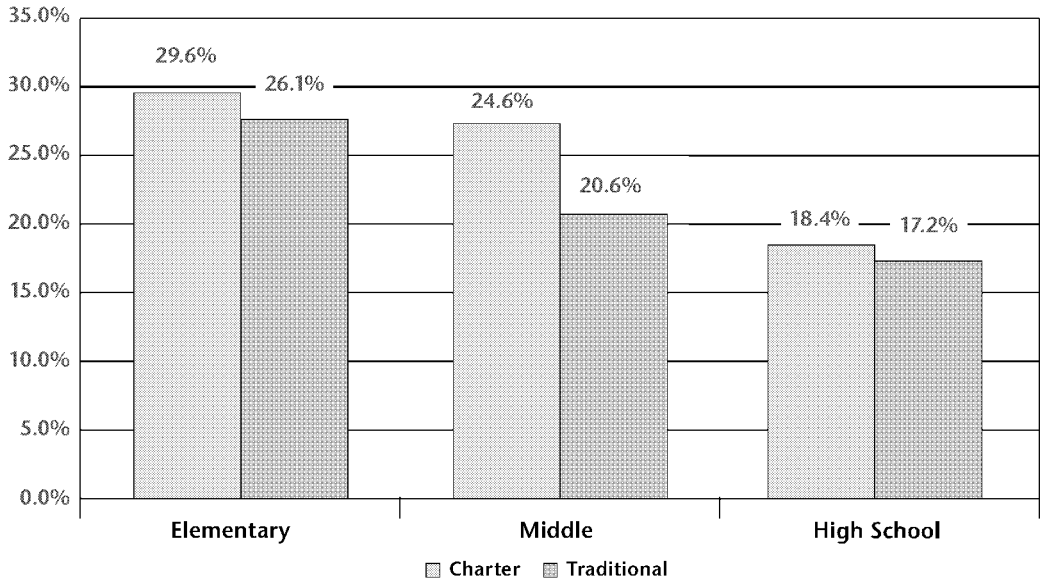
SUB-GROUP COMPARISONS 2009

Percent of Students Scoring a Level 3 or Above on FCAT Science
Charter Schools and Traditional Public Schools
White Students

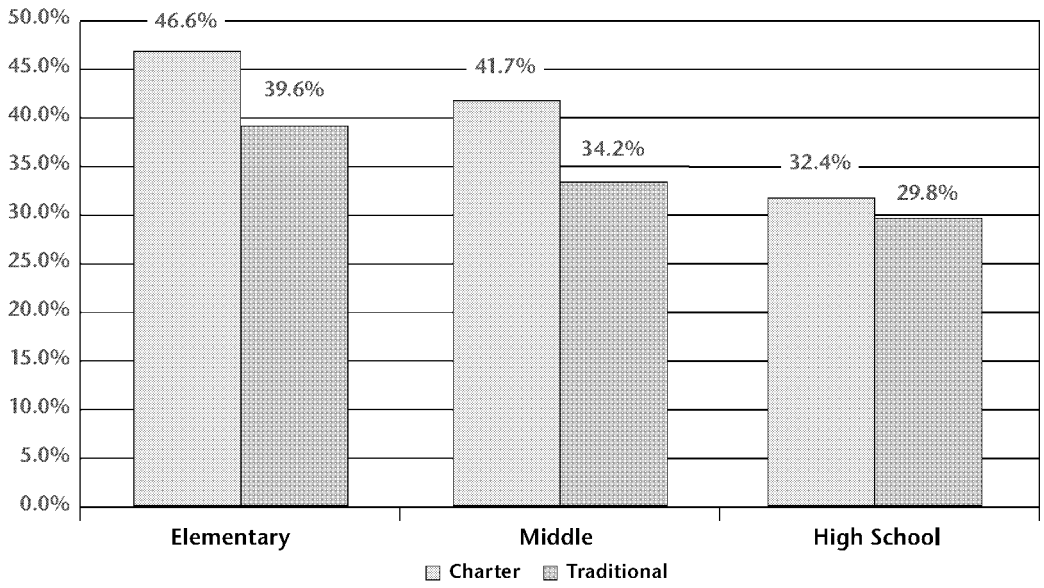


Science

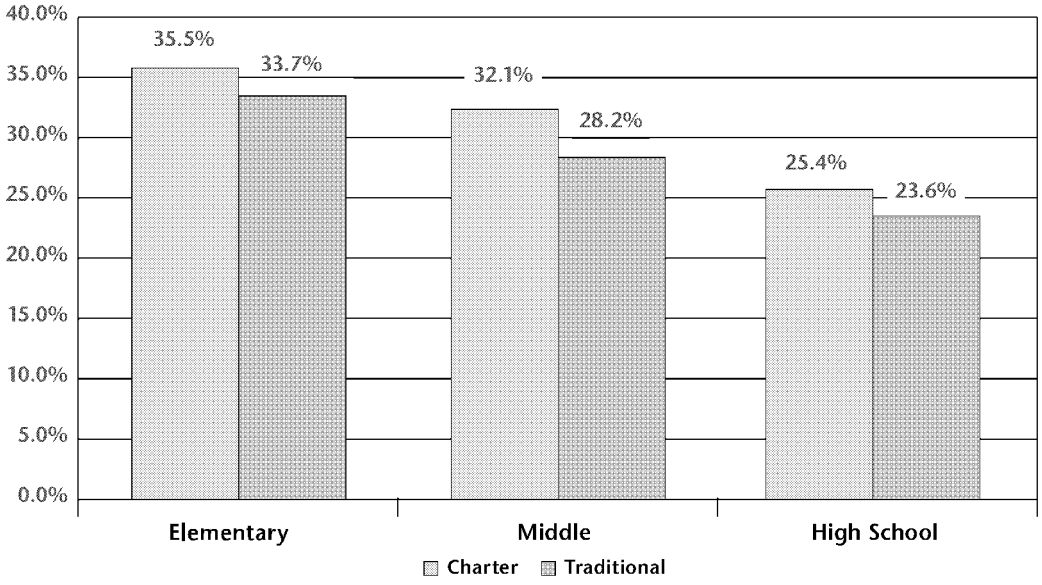
Percent of Students Scoring a Level 3 or Above on FCAT Science
Charter Schools and Traditional Public Schools
African-American Students



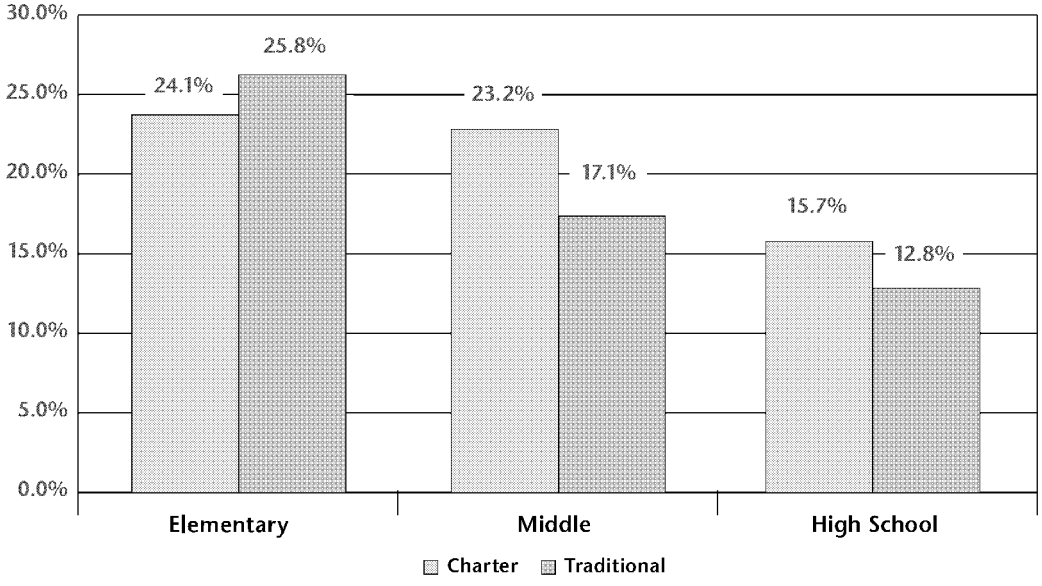
Percent of Students Scoring a Level 3 or Above on FCAT Science
Charter Schools and Traditional Public Schools
Hispanic Students



Percent of Students Scoring a Level 3 or Above on FCAT Science
Charter Schools and Traditional Public Schools
FRL Students



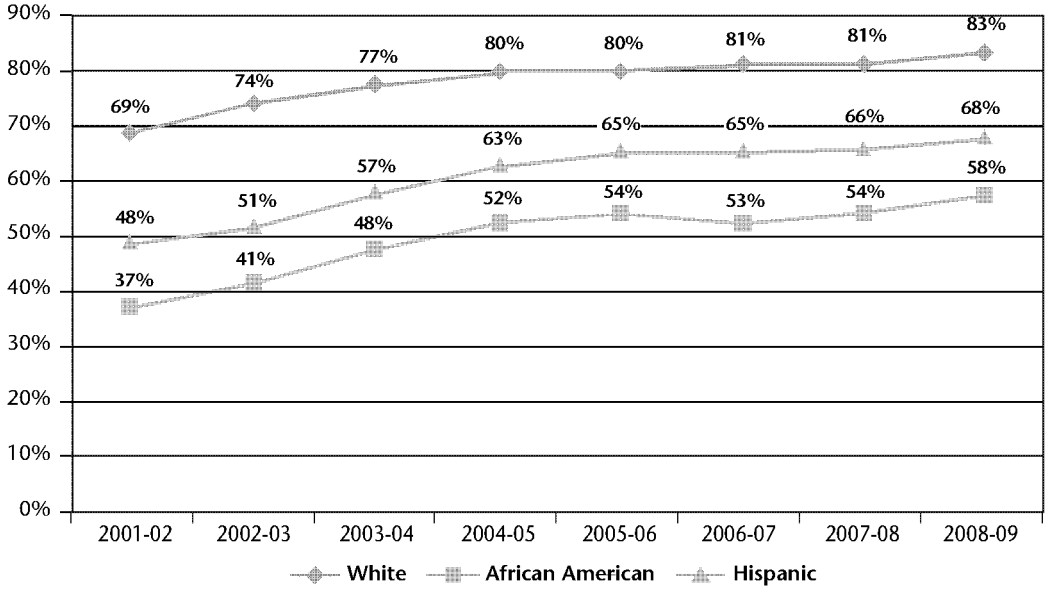
Percent of Students Scoring a Level 3 or Above on FCAT Science
Charter Schools and Traditional Public Schools
Exceptional Education Students



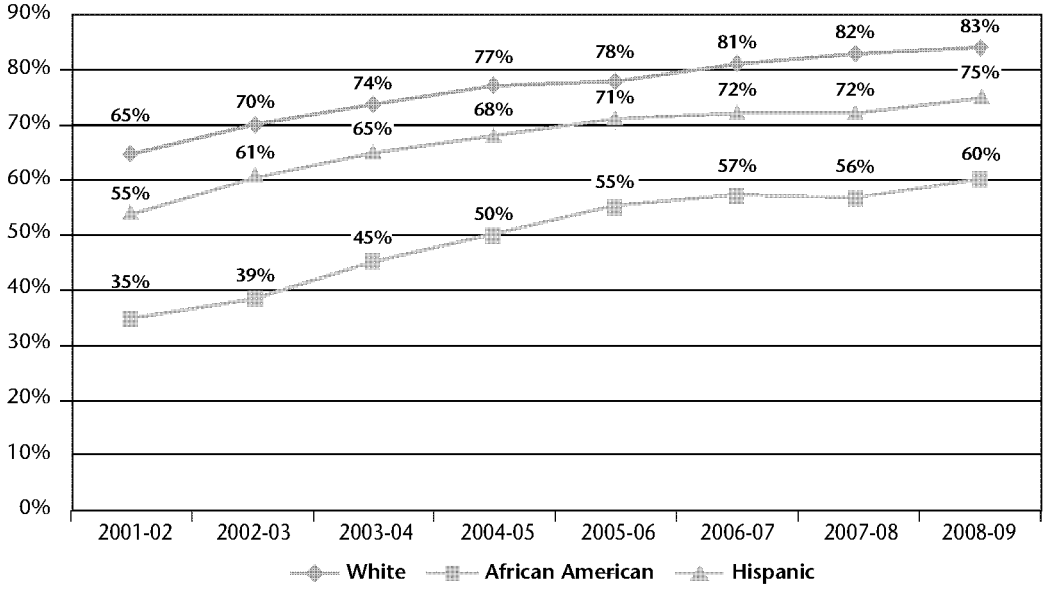
Closing the Achievement Gap in Reading Traditional Public Schools and Charter Schools 2002-2009

Reading

Traditional Public Elementary Schools
FCAT Reading Achievement Level 3 and Above
Grades 3, 4, and 5 by Race/Ethnicity

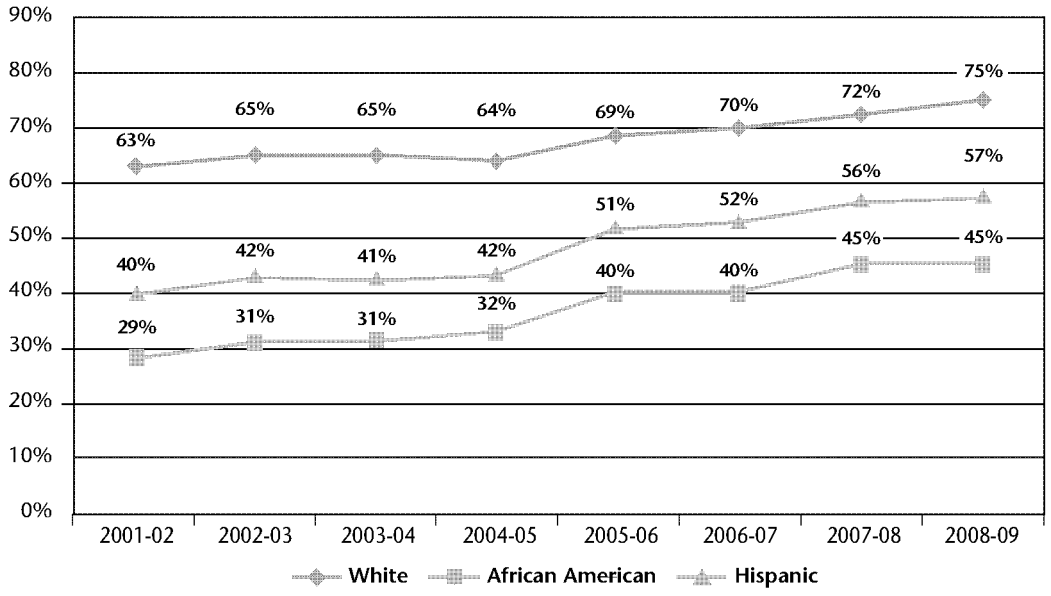


Charter Elementary Schools
FCAT Reading Achievement Level 3 and Above
Grades 3, 4, and 5 by Race/Ethnicity

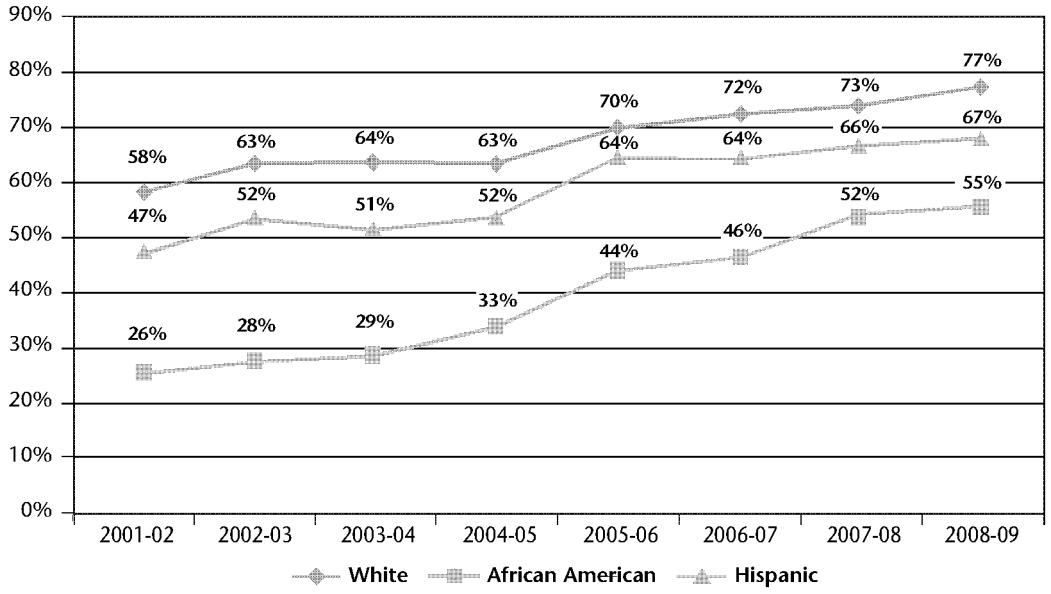


Reading

Traditional Public Middle Schools
FCAT Reading Achievement Level 3 and Above
Grades 6, 7, and 8 by Race/Ethnicity

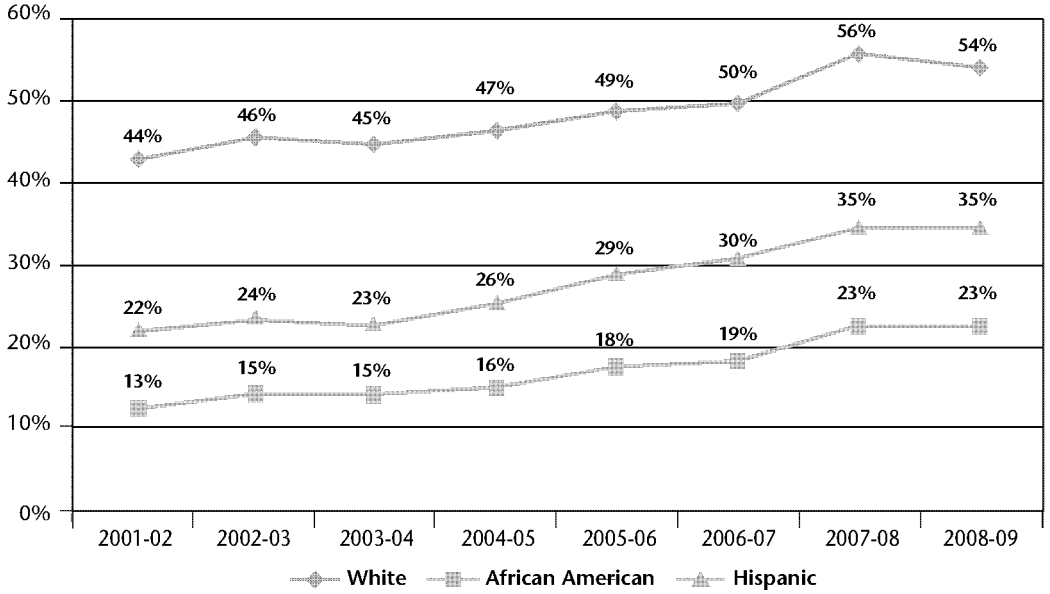


Charter Middle Schools
FCAT Reading Achievement Level 3 and Above
Grades 6, 7, and 8 by Race/Ethnicity

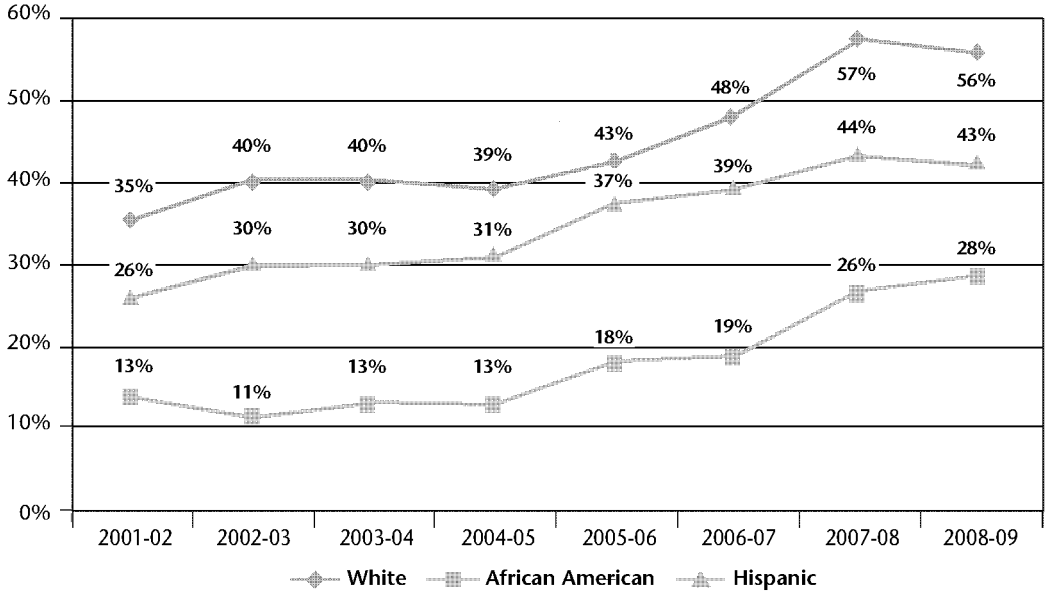


Reading

Traditional Public High Schools
FCAT Reading Achievement Level 3 and Above
Grades 9 and 10 by Race/Ethnicity



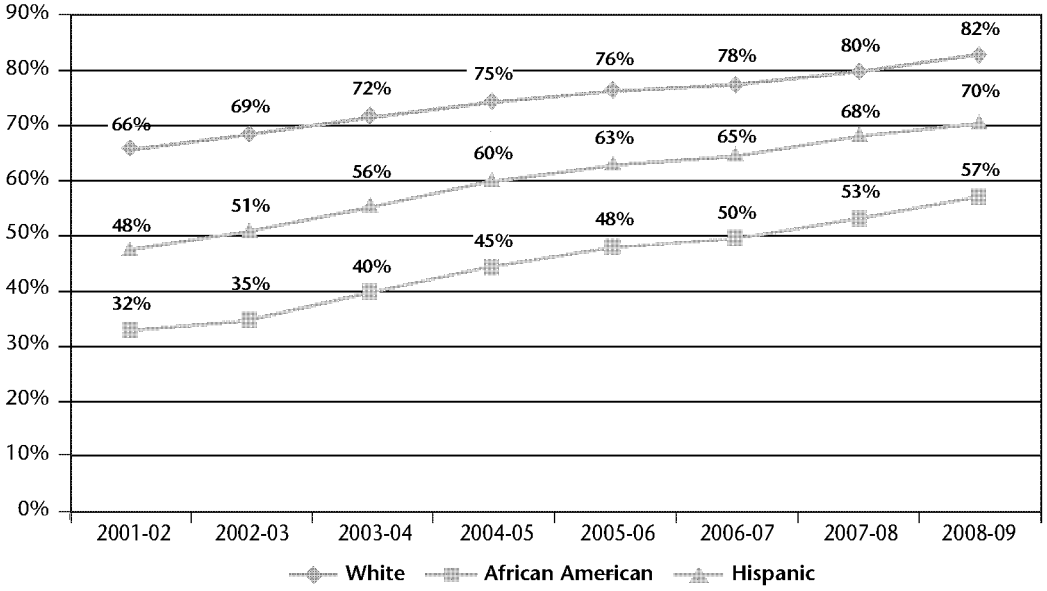
Charter High Schools
FCAT Reading Achievement Level 3 and Above
Grades 9 and 10 by Race/Ethnicity



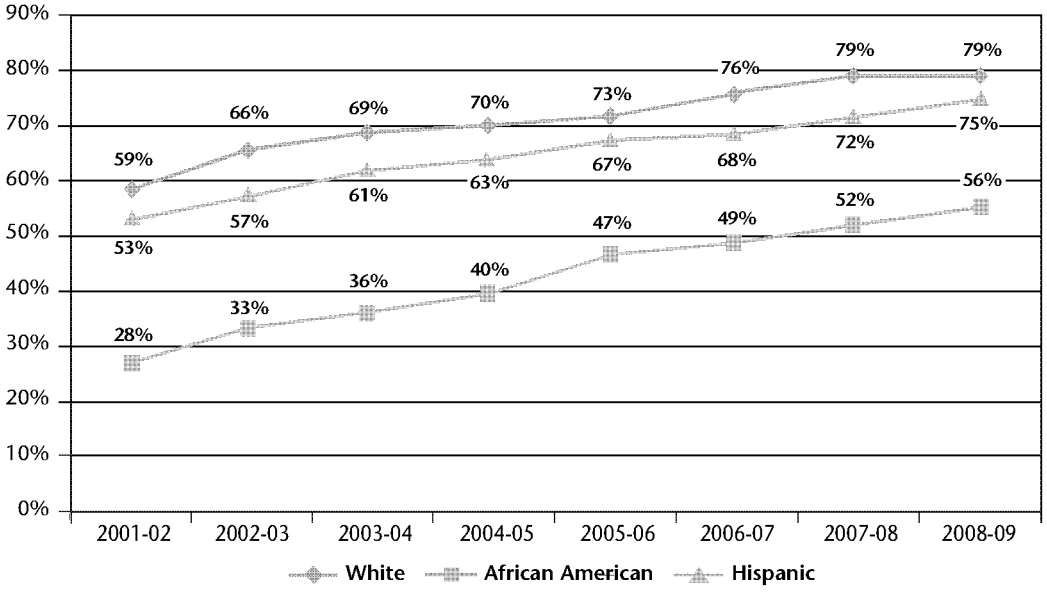
Closing the Achievement Gap in Math
Traditional Public Schools and Charter Schools
2002-2009

Math

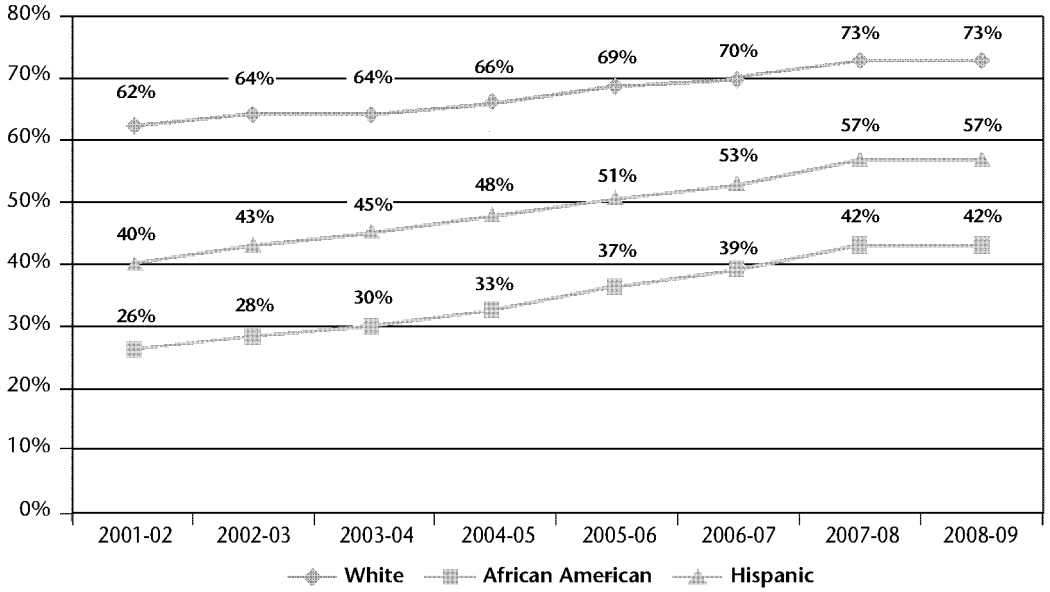
Traditional Public Elementary Schools
FCAT Math Achievement Level 3 and Above
Grades 3, 4, and 5 by Race/Ethnicity



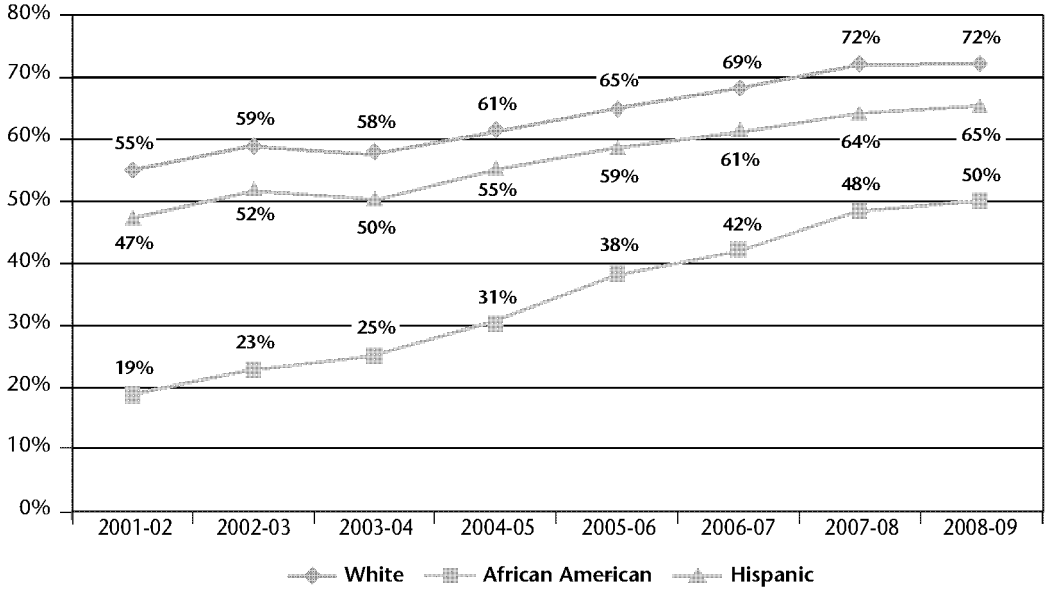
Charter Elementary Schools
FCAT Math Achievement Level 3 and Above
Grades 3, 4, and 5 by Race/Ethnicity



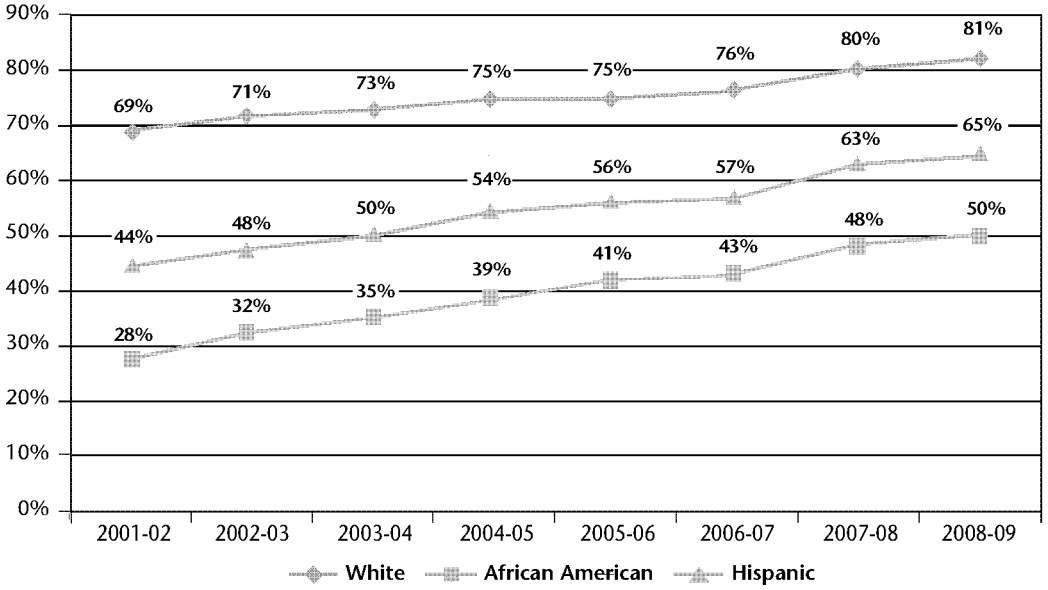
Traditional Public Middle Schools
FCAT Math Achievement Level 3 and Above
Grades 6, 7, and 8 by Race/Ethnicity



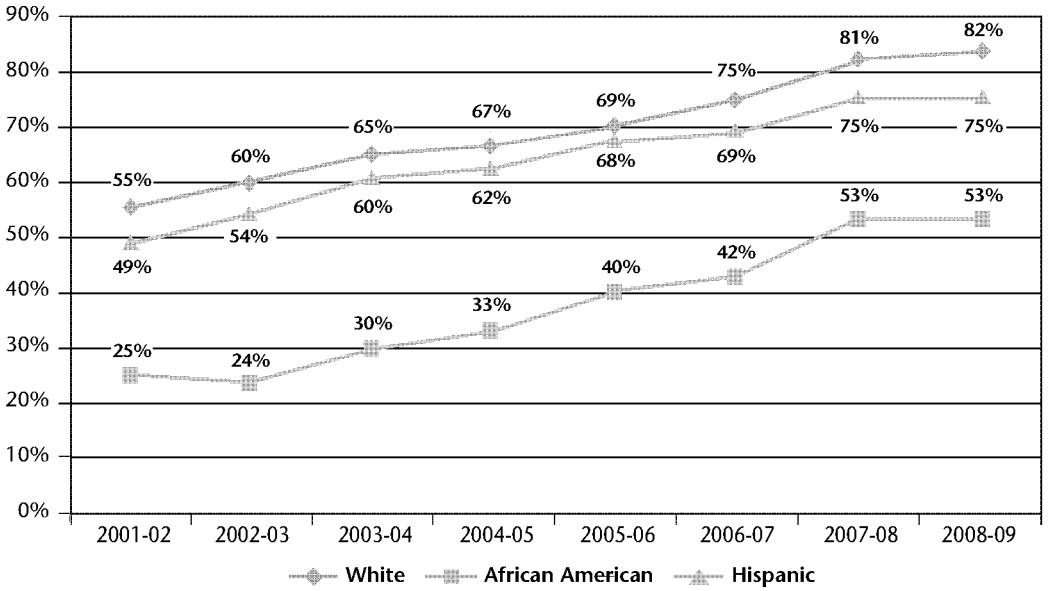
Charter Middle Schools
FCAT Math Achievement Level 3 and Above
Grades 6, 7, and 8 by Race/Ethnicity



Traditional Public High Schools
FCAT Math Achievement Level 3 and Above
Grades 9 and 10 by Race/Ethnicity



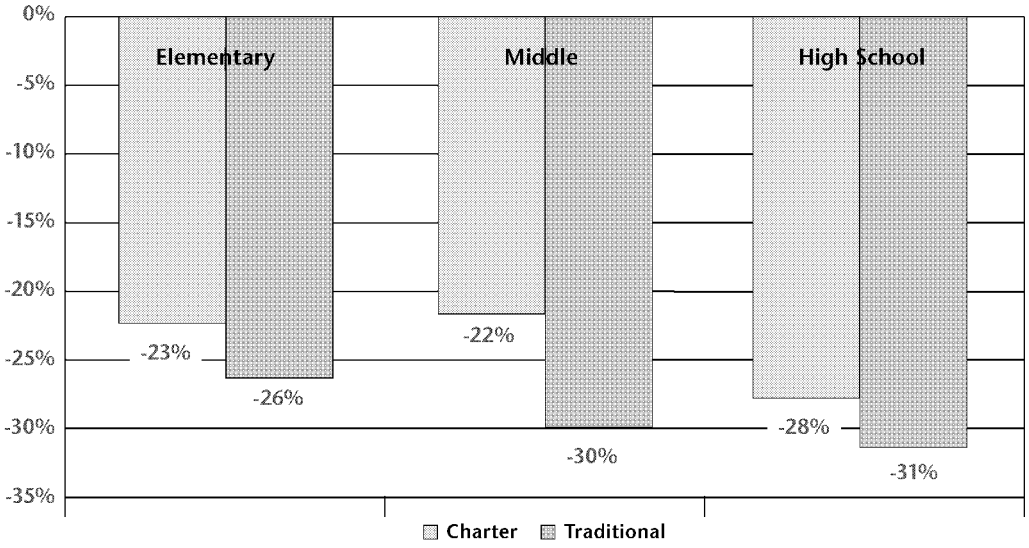
Charter High Schools
FCAT Math Achievement Level 3 and Above
Grades 9 and 10 by Race/Ethnicity



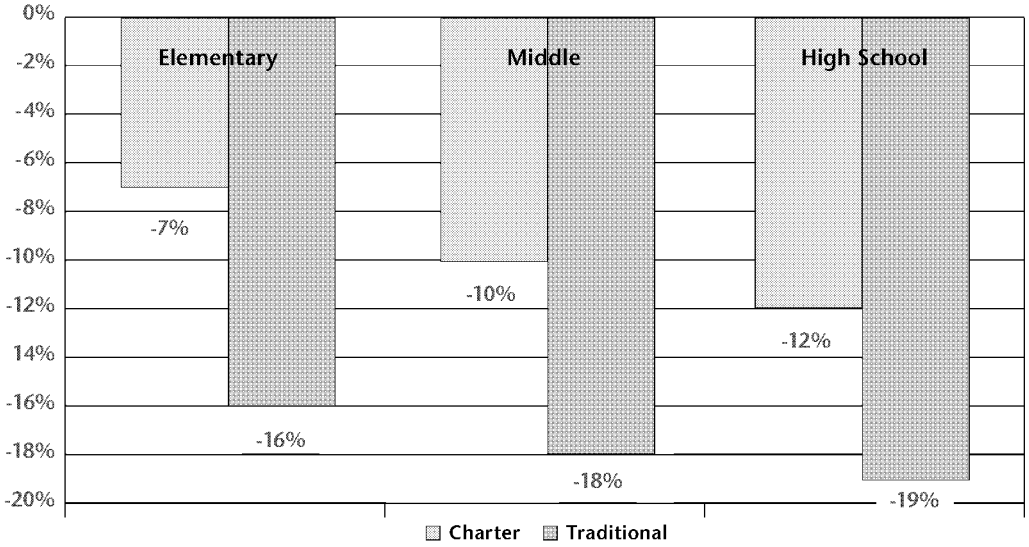
Achievement Gap Summary Data
2008-09 School Year

Reading

Achievement Gap in Reading
Charter Schools and Traditional Public Schools
African-American Students and White Students

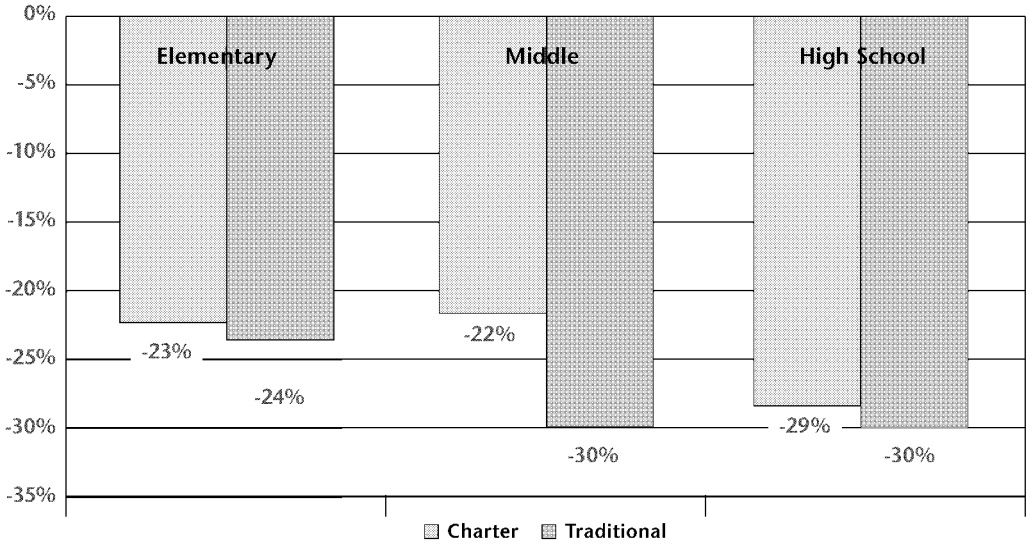


Achievement Gap in Reading
Charter Schools and Traditional Public Schools
Hispanic Students and White Students

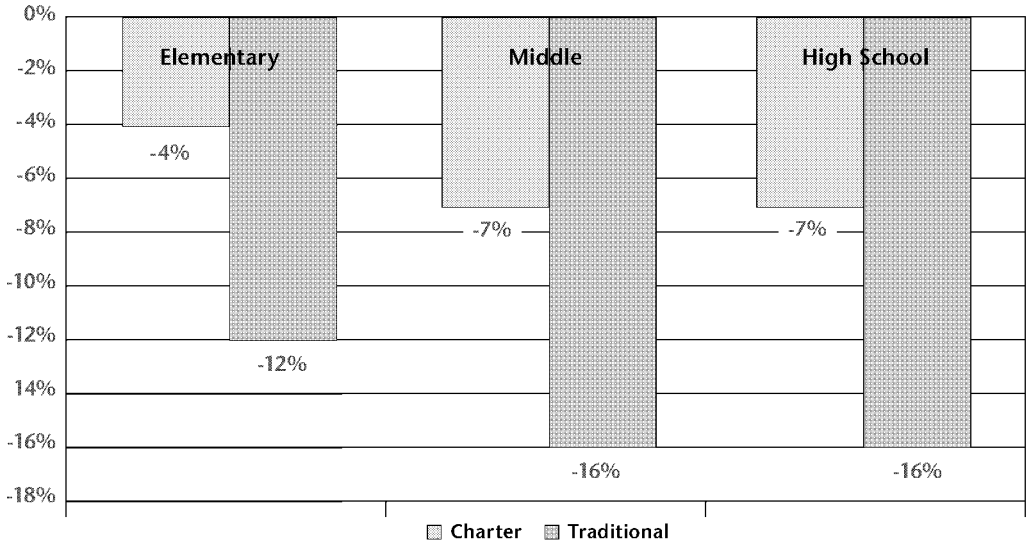


Math

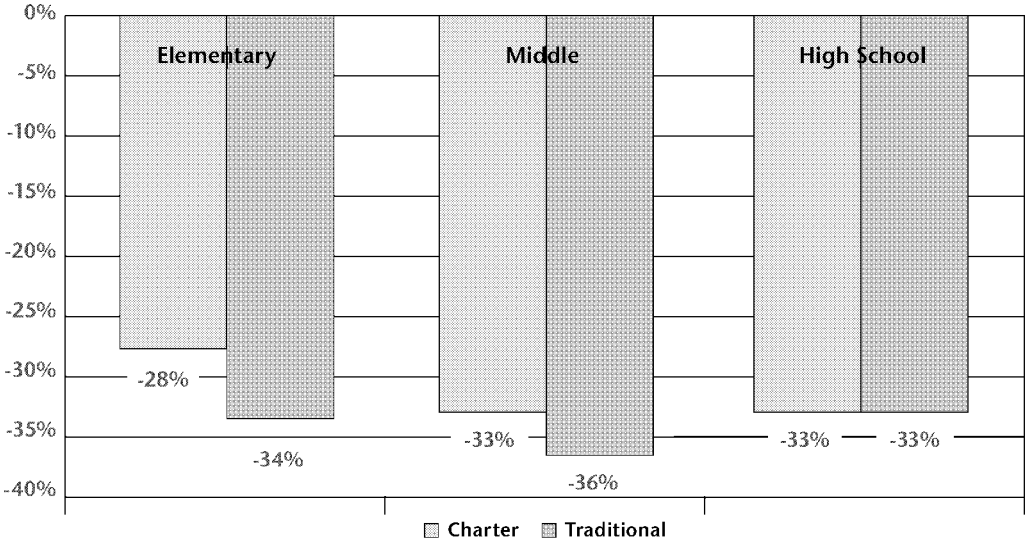
Achievement Gap in Math
Charter Schools and Traditional Public Schools
African-American Students and White Students



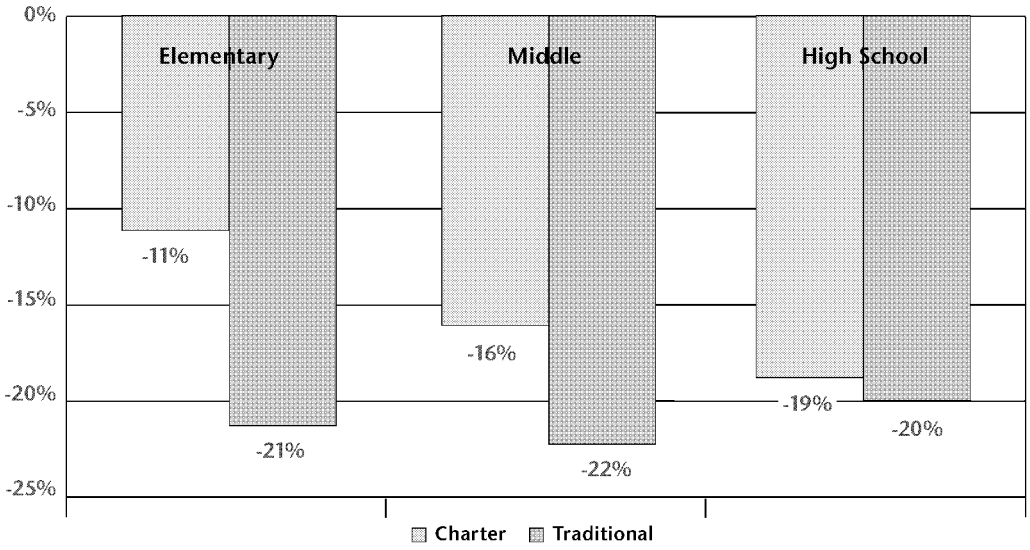
Achievement Gap in Math
Charter Schools and Traditional Public Schools
Hispanic Students and White Students



Achievement Gap in Science
Charter Schools and Traditional Public Schools
African-American Students and White Students

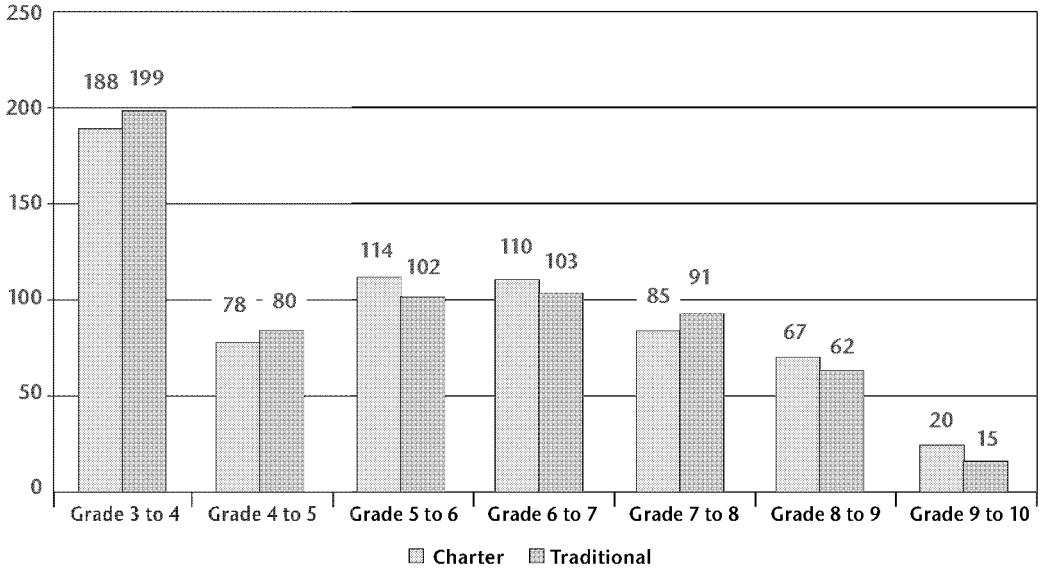


Achievement Gap in Science
Charter Schools and Traditional Public Schools
Hispanic Students and White Students

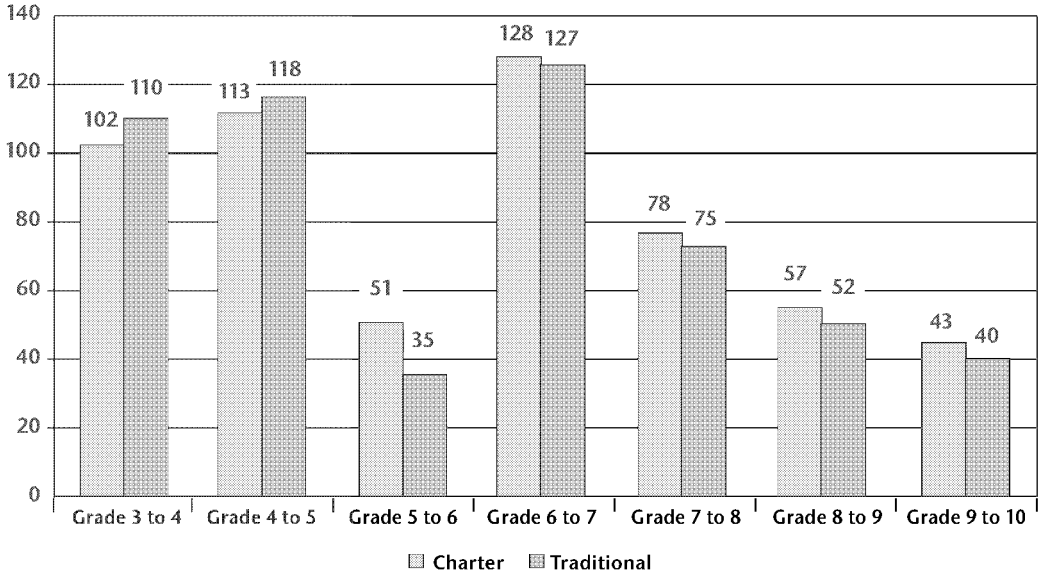


Developmental Scale Scores Learning Gains Comparison 2008-2009 School Year

DSS Gains Reading
Charter Schools and Traditional Public Schools



DSS Gains Math
Charter Schools and Traditional Public Schools



Key Achievement Findings

The ultimate proof of success for any charter school is the achievement of its students. If students are not learning at or above the levels at which they were learning when they enrolled in a charter school, then the primary mission of the charter school has not been accomplished. The analysis of 2008-09 student achievement data demonstrates that charter schools offer parents and policy makers a viable option for improving education in the state.

The data contained in this report is derived from student performance on the Florida Comprehensive Achievement Test (FCAT), and is designed to allow a comparative analysis of the academic achievement of students attending charter schools versus students attending traditional public schools. The report contains data spanning eight years of FCAT results. Using data from the 2008-2009 school year the report makes 86 comparisons covering three measurements: FCAT proficiency percentages, achievement gaps, and learning gains. Each of these measurement areas are further broken down to offer a more nuanced view of student achievement.

The FCAT proficiency percentages are used to measure both overall rates of proficiency by grade groupings, as well as comparisons of subgroup performance. This section of the report contains 54 separate comparisons of student achievement. Charter school students outperformed traditional public school students in 47 of the 54 comparisons.

The achievement gap section of the report contains both historical and current data that is used to analyze the gap between white students and African American students and white students and Hispanic students, in reading, math, and science. This section of the report includes 18 separate comparisons of current achievement gaps. The achievement gap was lower for charter school students in 17 of the 18 comparisons, with one tie.

The learning gains section of the report contains data on the FCAT Developmental Scale Scores. The data includes 14 comparisons of the learning gains made by charter school students and traditional public school students. Charter school students had higher average learning gains in 9 of the 14 comparisons

Data

DATA 2008-2009					
		Charter		Traditional	
Total # of Students with FCAT results	Reading	63,590		1,386,911	
	Math	63,560		1,384,649	
Total % Proficient					
	Reading	%	Total Students	%	Total Students
	Elem	76.2	25,678	73.2	529,549
	Mid	69.6	28,144	63.7	515,257
	High	44.7	9,768	43	147,255
	Math				
	Elem	73.6	25,688	72.9	529,456
	Mid	65.9	28,141	62.1	514,908
	High	73.3	9,731	70.5	340,285
	Science				
	Elem	48.6	8,137	47.3	171,966
	Mid	45.6	8,308	43	171,106
	High	37.6	4,349	38.5	150,068
Total % Proficient by Race					
	Reading - White				
	Elem	82.7	11,241	83.1	237,993
	Mid	77.1	11,559	74.7	241,481
	High	55.5	3,622	54.2	167,870
	Math - White				
	Elem	79.3	11,239	81.6	237,949
	Mid	72.4	11,553	72.6	241,330
	High	82	3,614	80.8	167,180
	Science - White				
	Elem	57.3	3,611	60.3	78,910
	Mid	57.3	3,335	56.1	81,053
	High	51.2	1,677	50.2	75,019
	Reading - African Am.				
	Elem	60.1	4,619	57.5	118,522
	Mid	55.2	5,242	44.8	112,950
	High	27.6	2,104	23.1	73,147
	Math - African Am.				
	Elem	56.1	4,626	57.2	118,474
	Mid	50	5,247	42.2	112,867
	High	53.4	2,088	50.4	72,693
	Science - African Am.				
	Elem	29.6	1,458	26.1	37,420
	Mid	24.6	1,497	20.6	37,263
	High	18.4	912	17.2	31,898

Data

	Reading - Hispanic				
	Elem	75.3	7,970	67.6	135,475
	Mid	67.2	9,721	56.9	127,267
	High	43.2	3,575	35.2	81,080
	Math - Hispanic				
	Elem	74.9	7,975	69.5	135,473
	Mid	65.4	9,719	56.9	127,178
	High	75	3,566	64.5	80,459
	Science - Hispanic				
	Elem	46.6	2,485	39.6	43,490
	Mid	41.7	3,006	34.2	42,038
	High	32.4	1,542	29.8	34,292
Total % Proficient by Free and Reduced Lunch					
	Reading				
	Elem	66.5	10,260	63.3	298,828
	Mid	59.6	11,726	51.3	265,877
	High	33.4	3,838	28.9	142,949
	Math				
	Elem	64	10,273	63.7	298,751
	Mid	55.2	11,724	49.3	265,633
	High	65.6	3,831	58.2	141,954
	Science				
	Elem	35.5	3,146	33.7	94,285
	Mid	32.1	3,310	28.2	84,763
	High	25.4	1,544	23.6	56,011
Total % Proficient by ESE					
	Reading				
	Elem	49.6	2,549	45.3	78,494
	Mid	42.2	2,401	31.2	66,394
	High	18.5	713	13.9	35,828
	Math				
	Elem	50.1	2,557	49.2	78,481
	Mid	37.7	2,405	29	66,318
	High	45.9	711	33	35,472
	Science				
	Elem	24.1	742	25.8	24,815
	Mid	23.2	673	17.1	21,381
	High	15.7	299	12.8	14,033

Florida Department of Education
Eric J. Smith, Commissioner
www.fldoe.org

Office of Independent Education and Parental Choice
325 West Gaines Street, Suite 522
Tallahassee, FL 32399-0400
850/245-0502
www.floridaschoolchoice.org

Bureau of Research and Evaluation
325 West Gaines Street, Suite 834
Tallahassee, FL 32399-0400
850/245-0429
www.fldoe.org/evaluation/

November 2009

SCHOOL CHOICE
Florida Department of Education

FLORIDA'S CHARTER Schools

F-7: VPK FACT SHEET JANUARY 2010

Office of Early Learning

(b)(6)

Implementing Florida's Voluntary Prekindergarten (VPK) Education Program

The Department of Education/Office of Early Learning (DOE/OEL) works in collaboration with the Agency for Workforce Innovation (AWI) and the Department of Children and Families (DCF) to implement the Voluntary Prekindergarten (VPK) Education program, with specific responsibilities for the following:

- Administration of accountability requirements at the state-level
- Provision of professional development including emergent literacy and director credential course(s)
- Approval of VPK director credential requirements
- Adoption/administration of a statewide kindergarten screening
- Review and approval of curricula for providers on probation for failure to meet readiness rate
- Calculation of kindergarten readiness rate
- Articulation of the Child Development Associate (CDA) or Florida Child Care Professional Certificate (FCCPC) (previously referred to as the Florida CDA-Equivalency (CDA-E)) credential toward a post secondary degree.

Recent VPK Accomplishments

- The Training Management System (TMS) is available to providers wishing to register for Professional Development opportunities at www.myflorida.com/childcare
- Online VPK Teacher Toolkit targeting VPK Language and Vocabulary folder is available at www.flvpkonline.org/teachertoolkit
- Online *Language and Vocabulary in the VPK Classroom* course is now available! You may now register for this DOE-approved online course by visiting Department of Children and Families' Web site at https://training01-dcf.myflorida.com/dcf/cct/inf0001.html . Successful completion of this five-hour course will generate 0.5 CEUs.
- 147,765 children or 63% of all four-year-olds participated in the 2008-09 VPK Program
- 141,070 children or 61% are enrolled in the 2009-10 School Year VPK Program (as of December 29, 2009)

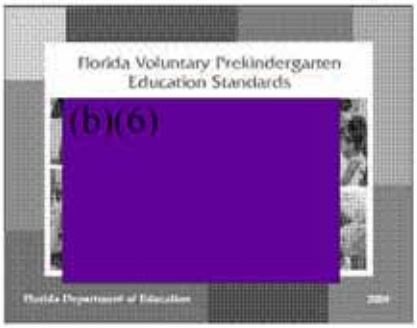
DOE Online Courses

Course (Release Date)	Participants as of December 31, 2009	Participants who Successfully Completed the Course
Emergent Literacy Online Course (2006)	62,734	46,111 (73.5%)
VPK Director Credential Online Course (2006)	19,164	10,765 (56%)
English Language Learners Online Course (2009)	3311	3,006 (91%)

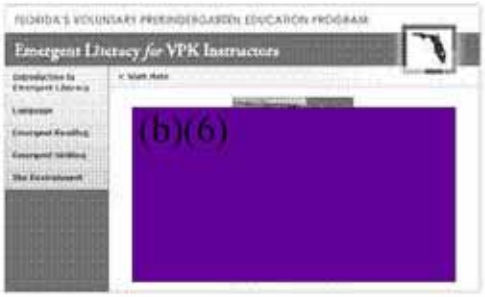
Selected DOE Instructor Led Courses

Course (Release Date	Manuals Distributed as of December 31, 2009
VPK Standards Training (2005) VPK Standards Training (2008) **Total**	17,408 12,904 **30,312**
It's Okay to Play Parent Workshop (2007)	153,188

DOE/OEL provides training and technical assistance through regularly-scheduled telephone conference calls with school districts and coalitions, product distribution, video teleconferences, other meeting and conference presentations, and its website.



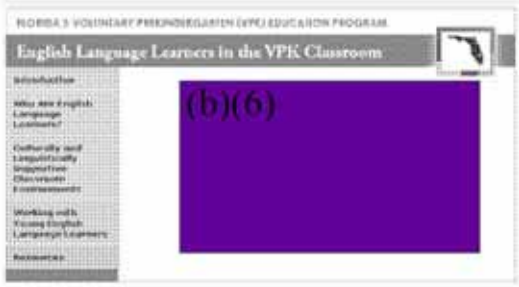
DOE/OEL provides a network of VPK Regional Facilitators working with early learning coalitions and public and private providers throughout the state. Facilitators conduct training on various topics to include the VPK Education Standards. If you are interested in viewing and/or registering for a DOE-approved online or instructor-led course, please go to DCF's website at https://training01-dcf.myflorida.com/dcf/cct/reg/courseselector



Coming Soon

VPK Teacher Toolkit Additions:
http://www.flvpkonline.org/teachertoolkit/

- Mathematical Thinking folder **available NOW!**
- Emergent Literacy folder **available Spring 2010**
- English Language Learners folder **available Spring 2010**



For further information on DOE VPK initiatives or any of these materials, please contact

Shan Goff, Executive Director
Office of Early Learning
Florida Department of Education
325 West Gaines Street
Turlington Building, Suite 514
Tallahassee, FL 32399-0400
Phone: (850) 245-0445
Toll-free Number: (866) 447-1159
Fax: (850) 245-5105
Email: earlylearning@fldoe.org

F-8 - 2007-08 VPK VS NONVPK COMPARISONS ON KINDERGARTEN SCREENING

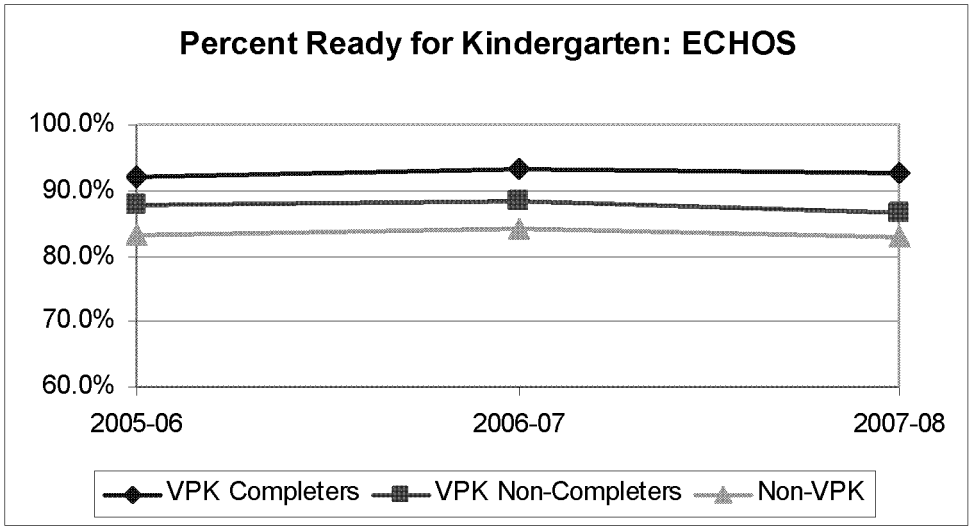
Florida Department of Education
Office of Early Learning

Kindergarten Screening

- The kindergarten screening instruments used for 2006-07, 2007-08 and 2008-09 included the Early Childhood Observation System™ and the first two measures of the Dynamic Indicators of Basic Early Literacy Skills™; Letter Naming Fluency and Initial Sound Fluency.
- Screening occurs during the first 30 days of kindergarten.
- VPK participants attending kindergarten in nonpublic schools are also provided opportunities to participate in the screening.

Early Childhood Observation System (ECHOS)

- The results for the ECHOS are calculated by using the ratings teachers assigned to 19 activities as a result of their on-going classroom observation. These 19 activities include skills such as:
    - Knowing how to use a book (Concepts of Print)
    - Retelling a story or part of a story that has been read to the class (Oral Language/Vocabulary)
    - Recognizes, creates, and analyses patterns (Algebraic Thinking)
    - Talks to and plays cooperatively with other children (Social Problem Solving).
- Children that are considered "Ready for Kindergarten" have scored at the "Demonstrating" or "Emerging/Progressing" levels.



ECHOS	2005-06	2006-07	2007-08
VPK Completers	92.0%	93.4%	92.5%
VPK Non-Completers	87.9%	88.3%	86.5%
Non-VPK	83.3%	84.1%	83.0%

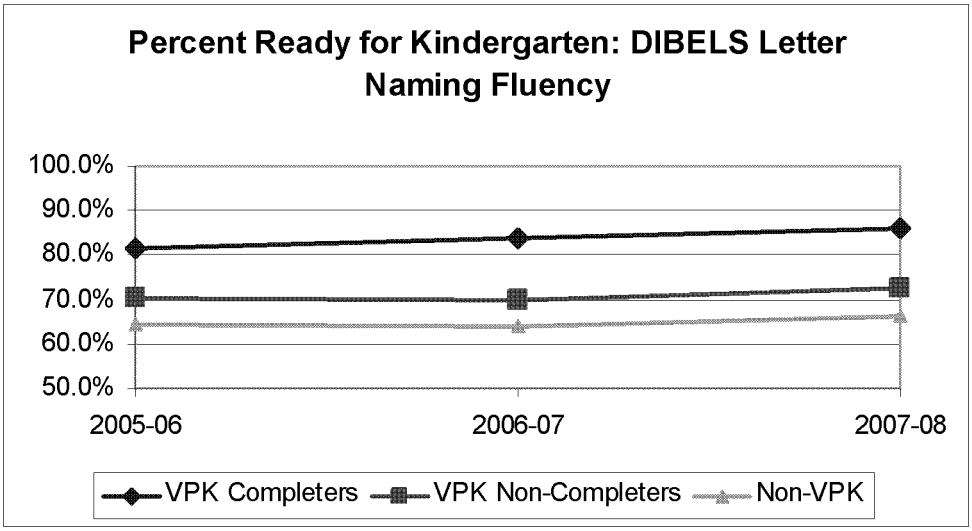
F-8 - 2007-08 VPK VS NONVPK COMPARISONS ON KINDERGARTEN SCREENING

Florida Department of Education
Office of Early Learning

DIBELS – Letter Naming Fluency (LNF)

- The Letter Naming Fluency measures pre-reading and early reading skills. Specifically, the student's ability to "see – say" upper and lower case letters of the alphabet.

- Children considered "Ready for Kindergarten" have scored at the "Above Average" or "Low Risk" levels.



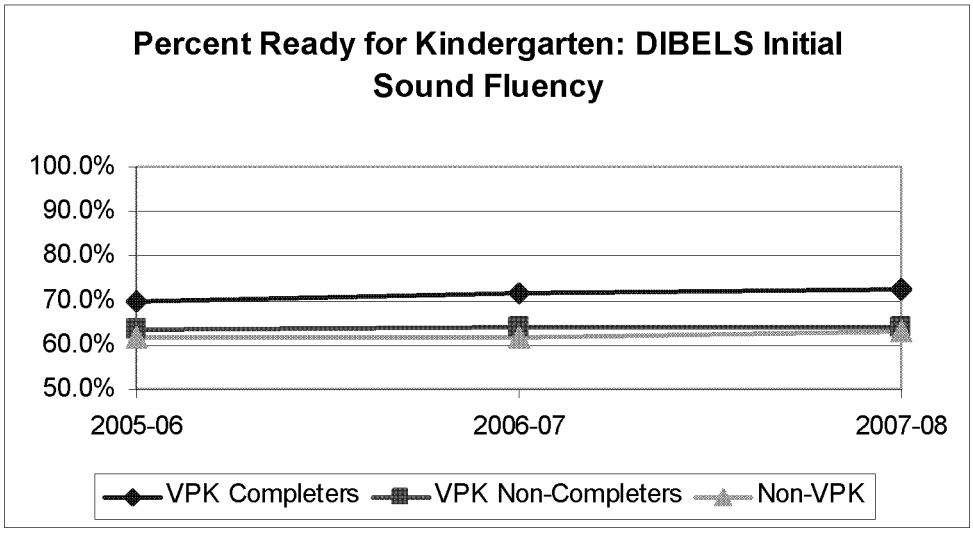
DIBELS LN	2005-06	2006-07	2007-08
VPK Completers	81.7%	83.6%	86.2%
VPK Non-Completers	70.4%	70.0%	72.6%
Non-VPK	64.3%	64.0%	66.4%

F-8 - 2007-08 VPK VS NONVPK COMPARISONS ON KINDERGARTEN SCREENING

Florida Department of Education
Office of Early Learning

DIBELS – Initial Sound Fluency

- The Initial Sound Fluency measures pre-reading and early reading skills. Specifically, the student's ability to recognize the beginning sound(s) in a spoken word.
- Children considered "Ready for Kindergarten" have scored at the "Above Average" or "Low Risk" levels.



DIBELS IS	2005-06	2006-07	2007-08
VPK Completers	69.9%	71.6%	72.7%
VPK Non-Completers	63.7%	63.8%	64.1%
Non-VPK	61.8%	61.8%	63.2%

P-1 - STEMflorida Plan:

Developing an Action Plan for Systemic Reform of STEM Education and Workforce Readiness in Florida

"It is easy to be complacent about U.S. competitiveness and preeminence in science and technology. We have led the world for decades, and we continue to do so in many research fields today. But the world is changing rapidly, and our advantages are no longer unique. Some will argue that this is a problem for market forces to resolve—but that is exactly the concern. Market forces are already at work moving jobs to countries with less costly, often better educated, highly motivated work forces and more friendly tax policies."
-Rising Above the Gathering Storm, 2005

Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future. (2005). Retrieved January 28, 2009, from National Academy of Sciences: http://www.nap.edu/catalog.php?record_id=11463

"If the United States had in recent years closed the gap between its educational achievement levels and those of better-performing nations such as Finland and Korea, GDP in 2008 could have been $1.3 trillion to $2.3 trillion higher. This represents 9 to 16 percent of GDP."
"The recurring annual economic cost of the international achievement gap is substantially larger than the deep recession the United States is currently experiencing."

McKinsey & Company. (2009). *The Economic Impact of the Achievement Gap in America's Schools*, p. 10.

Background

In January 2009, after consulting with business and education leaders, Enterprise Florida, Inc. (EFI) released a Discussion Paper on K-12 STEM (Science, Technology, Engineering, and Mathematics) Education. EFI's Action Recommendation was to call for the creation of a Florida STEM Council to "act as a formal conduit for business direction, support, and engagement in STEM education." Simultaneously, FCR-STEM, working with the Florida Chamber, began the process of establishing a task force of business, education, and government representatives to develop a STEM Plan for the State of Florida. In late summer, prior to the first meeting of the task force, Workforce Florida, Inc. (WFI), announced a request for proposals (RFP) to provide $580,000 in support of efforts to improve STEM outcomes in Florida. In order to avoid duplication of efforts and increase the likelihood of developing a STEM Plan that would have a state-wide impact, leaders of the FCR-STEM task force made a decision to collaborate with the Consortium of Florida's Education Foundations and others in responding to the RFP. In October 2009 our joint proposal, STEM*florida*, was selected. Under this proposal, the STEM*florida* Business Steering Council is to be created. This council is the equivalent of the Florida STEM Council described by EFI, above. **Advising this council on a plan to move forward in the creation of a Florida STEM Plan, synthesizing the statewide input from both the business and education communities, will be our STEM*florida* Education Advisory Group.**

Work of the STEM*florida* Education Advisory Group

Our STEM*florida* Education Advisory Group will work collaboratively to produce a **Florida STEM Plan** by December 2010 that will include strategies to:

- address educational initiatives to support existing and prospective STEM based industry;
- increase student enrollment in STEM curricula;
- increase student achievement goals in mathematics and science;
- close the gap between STEM entry-level workforce readiness needs and an available STEM prepared workforce;
- increase the percentage of all Floridians who are literate in STEM content and issues;
- increase postsecondary readiness for 21st Century STEM related careers;
- provide regional educational solutions to regional STEM workforce needs.

This Florida STEM Plan will be created using input from the business and education communities. A series of reports is being compiled to provide us with the most current information on the state of STEM education in Florida, the stated STEM needs of the business community, and evidence-based approaches for addressing those needs. These reports and their release dates are as follows:

- The State of STEM in Florida (Release date: December 2009)
- The STEM*florida* Business Roundtable Report (Release date: July 2010)
- The STEM*florida* Education Link Report (Release date August 2010)

In order to develop perspective broad enough to come to consensus as the Florida STEM Plan is written, we will gather evidence from STEM education research, relevant policy, and other STEM programs, both within and external to Florida. Table 1 includes a sample of STEM

Table 1: A Sample of States' STEM Initiatives

Alabama
Alabama Math, Science, and Technology Initiative
http://www.amsti.org/

Arizona
Arizona Initiative for Math and Science Education
http://educationpartnerships.asu.edu/content/arizona-initiative-math-science-education

Colorado
Colorado Math, Science, Technology, and Engineering Education Coalition http://www.coloradostemeducation.com/

Georgia
Georgia's Partnership for Reform in Science and Mathematics PRISM http://www.gaprism.org/

Pennsylvania
Pennsylvania's STEM Initiative: An initiative of the NGA and the Team Pennsylvania Foundation
http://www.pasteminitiative.org/

Kentucky
Kentucky's STEM Imperative: Competing in the Global Economy http://cpe.ky.gov/committees/stem/

Massachusetts
The Massachusetts STEM Initiative
http://www.massachusetts.edu/stem/index.html

Texas
The Texas Science, Technology, Engineering, and Mathematics Initiative T-STEM http://www.thsp.org/initiatives/t_stem/

From the National Governors' Association report "Innovation America": "Many states have adopted effective innovation practices—if not yet a comprehensive innovation agenda—by making investments in K–12 education and raising science, technology, engineering, and math (STEM) standards; using their role as the main funders of higher education to improve these institutions' production of math and science-related degrees; and linking research and development to key industrial, economic, and labor and skills targets."

From "Innovation America: A Final Report". Retrieved January 23, 2009 from http://www.nga.org/portal/site/nga/menuitem.50aeae5ff70b817ae8ebb856a1101oa0

initiatives developed by other states. Table 2 includes a sample of ongoing STEM initiatives in Florida. Additionally, the following Science and Mathematics Education Policy White Paper (www.naeducation.org/Science_and_Mathematics_Education_White_Paper.pdf), released in October 2009 by the National Academy of Education, contains useful recommendations to inform our work.

Table 2. A sample of STEM initiatives in Florida

- Florida Department of Education Office of Mathematics and Science http://www.fldoestem.org
- FCR-STEM http://www.fcrstem.org
- Florida PROMiSE http://www.flpromise.org
- The PRISM Project http://www.theprismproject.org
- FSU Teach http://www.fsu-teach.fsu.edu
- UF Teach http://ufteach.clas.ufl.edu/index.html
- Florida SUMS http://www.nefec.org/floridasums
- Space Florida http://www.spaceflorida.gov
- Enterprise Florida http://www.eflorida.comWorkforce Florida, Inc. http://www.workforceflorida.comFlorida Chamber Foundation http://www.flchamber.com
- Coalition for Science Literacy at USF http://www.csl.usf.edu/

Implementation Plan

The proposed implementation plan in Table 3 was created to help our STEM*florida* Education Advisory Group complete the Florida STEM Plan by our December 2010 target date. During our December meeting we will discuss the scope of work based on this plan.

Table 3. Proposed Implementation Steps for the Creation of the Florida STEM Plan

Implementation Step	Date
Establish the STEM*florida* Education Advisory Group (SF-EAG), a consensus-building committee that will synthesize the business and education input. The Florida STEM Plan will be based on business goals as defined in the STEM*florida* Business Roundtable Report and business partner input.	Oct 2009
Meet with SF-EAG to discuss the scope of work based on the STEM*florida* Implementation Plan, the process, the timeline, and options for participation in developing the Florida STEM Plan.	Dec 2009
Survey SF-EAG members about their top STEM education priorities for Florida in preparation for linkage and support of the business-driven STEM goals.	Jan 2010
Meet with SF-EAG to report the survey results and work toward consensus on priorities.	Feb 2010
SF-EAG will work to develop perspective broad enough, informed by results of research, to come to consensus as the Florida STEM Plan is written. In order to keep informed, regular email updates on advances in STEM education research, relevant policy, and other STEM programs in place that could be utilized to support the business STEM goals will be sent to SF-EAG members.	Ongoing
Representatives from FCR-STEM will attend Business Round Table meetings to understand the context of the statements to be included in the STEM*florida* Business Report and to develop further relationships within the business community to aid in the consensus building process in support of linking education to the business STEM goals.	Jan -March 2010
Meet with SF-EAG to convey the results of the STEM*florida* Business Report and the STEM*florida* Education Link Report. Facilitate discussion about how to best use the input to develop a consensus plan.	Aug 2010
Based on the results of the August meeting, draft an outline of the Florida STEM Plan and post for input.	Sept 2010
Synthesize feedback and revise outline of the Florida STEM Plan accordingly. Reiterate process as needed.	Sept 2010
Based on approved outline of the Florida STEM Plan, create draft of the Florida STEM Plan Report. Post for input.	Oct 2010

Meet with the SF-EAG to revise the Florida STEM Plan. Come to consensus as to any major changes to the draft of the final plan. Post for review.	Oct 2010
Synthesize feedback and finalize the Florida STEM Plan accordingly.	Nov 2010
Present the plan to the Business Steering Council for review and approval.	Early Dec 2010

Composition of the STEM*florida* Education Advisory Group

Tables 4 and 5 contain the members of the STEM*florida* Education Advisory Group (SF-EAG), who are representatives from their respective business, education, and government communities.

Table 4. Executive Committee of the STEM*florida* Education Advisory Group

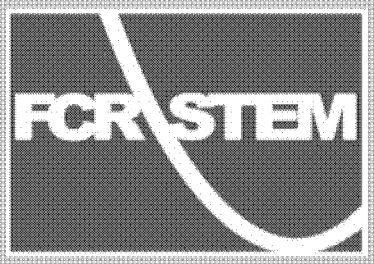
Sector	Agency/Organization	Representative
Government	Senate	Sen. Don Gaetz
	Florida Department of Education	Frances Haithcock
University	Florida State University University of Central Florida College of Engineering	Laura Lang, Mabry Gaboardi Marwan Simaan
PK-12 Education	Leon County Schools Brevard County Schools	Nancy Stokely Barbara Rodrigues
Innovation Industry Clusters	Banner Centers	Frank Fuller
Foundations/Organizations	Helios Consortium for Florida Education Foundations	Paul Luna, Stacey Carlson Mary Chance
College	Miami Dade College	Eduardo J. Padrón Heather Belmont
Rural Districts	Heartland Consortium Florida Learning Alliance	Tom Connor

Table 5. STEM*florida* Education Advisory Group Membership

Sector	Agency/Organization	Representative
Government, Business and Industry	Florida Dept of Education	Mary Jane Tappen, Kris Ellington
	Senate Select Committee on Florida's Economy	Sen. Don Gaetz
	Agency for Workforce Innovation	Kevin Neal
	Lake County School Board	Evan Lefsky
	Information Technology	Ben Amaba, IBM Shearon Arnott, FLVS Jim Clamons, Harris Corp.
	Aeronautics/Aviation & Aerospace	Mike Gillett, Lockheed Martin
	Manufacturing	Dr. Eric Roe, Manufacturer's Association of Florida
Foundations/Organizations	Orlando Chamber of Commerce	Leslie Heilema
	Florida Chamber Foundation	Tony Carvajal
	Florida Organization of Instructional Leaders	Anna-Marie Cote Seminole County
	Foundation for Excellence in Education	Patricia Levesque
	Helios Foundation	Stacey Carlson
PK-12 Education	Florida Association of District School Superintendents	Bill Montford, FADSS Sam Himmel, Citrus Co. Mike Lannon. St. Lucie Co.
	Florida Association of Science Supervisors	Ginger Davis, Brevard County Schools
	Pinellas County Schools	Rose Mack, Secondary Mathematics Supervisor
	Florida Association of School Administrators	Christi Moss
	Florida State Board of Education	Roberto Martinez
	School Boards	Ginger Littleton, Bay County School Board
Higher Education	Coalition for Science Literacy (University of South Florida)	Gerry Meisels
	Florida Board of Governors	R. E. LeMon Jon Rogers
	Florida Center for Research in Science,	Joe Travis,

	Technology, Engineering, and Math (Florida State University) National High Magnetic Field Laboratory (Florida State University, University of Florida)	Rob Schoen Greg Boebinger, Patricia Dixon

P-2: FCR-STEM FEMALE AND MINORITY INITIATIVE



Female-Minority Initiative

Final Report

February 17, 2009

Florida Center for Research
in Science, Technology, Engineering and Mathematics

Florida State University
Tallahassee, Florida

About FCR-STEM

The mission of the Florida Center for Research in Science, Technology, Engineering and Mathematics (FCR-STEM) is to engage in research, technical assistance, and dissemination that will (1) contribute to the scientific body of knowledge regarding how students learn science and mathematics, and how this learning is assessed; (2) improve teaching and learning in Florida's STEM classrooms; and (3) increase students' preparation for higher education and careers in the 21st Century. With a focus on improving classroom practice, the center aims to have an impact on the following outcomes:

- Improving student achievement in STEM
- Narrowing student achievement gaps in STEM
- Increasing student pursuit of STEM careers

Funded by the Florida Legislature, FCR-STEM is jointly administered by Florida State University's College of Arts & Sciences, College of Education, and Learning Systems Institute in the Office of the Provost. The center was created in state statute in 2006 and competitively awarded by the Florida Department of Education to Florida State University in February 2007.

FCR-STEM extends sincere gratitude to the Female-Minority Initiative Work Group and Advisory Panel members for their generous contribution of time and expertise to this project and for their impressive dedication to advancing the opportunities and success of females and underrepresented minorities in science, technology, engineering and mathematics.

TABLE OF CONTENTS

Overview.....6

Recommendations of the Female-Minority Work Group.....7

Actions Supported by Research.....21

Logic Models.....25

Next steps.....28

References.....29

Appendices

- APPENDIX A - Summary of Trends in Female and Minority STEM Achievement and Attainment: K-12 through Post-secondary Schooling in Florida
- APPENDIX B - Gender and Racial Attainment Disparities in Science and Mathematics: A Review of the Literature
- APPENDIX C - Possible measures for Evaluating the Success of the Plan
- APPENDIX D - Advisory Panel and Work Group Members

OVERVIEW

Purpose of the Female-Minority Initiative

In April 2007, FCR-STEM created the Female-Minority Initiative to address the objective of narrowing student achievement gaps in science, technology, engineering and mathematics (STEM) and respond to authorizing legislation requesting the center to "develop a comprehensive plan, with input from school districts, to increase the number and percentage of females and minority students enrolling in and successfully completing mathematics and science courses" (Florida Statutes, Section 1004.86). FCR-STEM expanded the scope of the plan beyond course-taking to include participation, achievement, and persistence in STEM education and careers from kindergarten through post-secondary education (K-20).

Development of the Plan

In June of 2007, a group of 10 professionals were selected to serve as advisory panel members and recommend participants for a Female-Minority Initiative Work Group that would develop the final plan. Also, the FCR-STEM project team, led by Project Manager, Faye Jones, began preparation of two documents to guide the Work Group's recommendations.

1. A summary of trends in female and minority STEM course-taking, achievement and degree attainment from K-12 through postsecondary education in Florida (See Appendix A).

2. A literature review, based on peer-reviewed journal articles, to aid in understanding the participation, choice, and persistence of females and underrepresented minorities in STEM from the elementary grades to postsecondary education (See Appendix B).

The Advisory Panel convened in Spring 2007 to help guide the process for developing the plan and identify K-20 education, research, and business stakeholders for the Work Group. Based on the Advisory Panel's input, a diverse Work Group of 37 members was selected, including representatives of Florida's school districts, community colleges, universities, businesses, Department of Education, and several STEM initiatives outside Florida (See Appendix D).

The Work Group held two 1-1/2-day meetings in Orlando. On November 13-14, 2007, members began to examine policies, programs and strategies that hold promise for increasing Florida's female and minority representation in STEM courses and STEM fields. After being presented with a summary of the literature review and data trends, members were asked to examine and answer the following question: *Which of the recommendations from the literature review and your own experiences show promise for increasing Florida's female and minority representation*

in STEM courses and STEM fields? This question was addressed in small groups first by region (North Florida, Central Florida, and South Florida) and then by school level (i.e., elementary, middle, high school, and post-secondary education). FCR-STEM small group facilitators digitally recorded all discussions and documented the recommendations in writing. The Work Group met again on May 22-23, 2008 to (1) examine Logic Models describing how Florida could close gender, racial, and ethnic gaps in STEM, (2) review and edit recommendations from the November 2007 meeting, and (2) identify potential measures of the plan's success (see Appendix C).

Summary of the Plan

Goal 1: Increase student interest and awareness

Recommendation 1: Launch media and outreach campaigns to raise student awareness of STEM careers.

Recommendation 2: Strengthen STEM-related counseling and advising.

Recommendation 3. Increase awareness and access to financial aid for college, particularly in STEM majors.

Goal 2: Improve STEM instruction

Recommendation 4: Implement research-based instructional strategies in K-12 mathematics and science.

Recommendation 5: Increase the rigor and relevance of course offerings.

Recommendation 6: Reduce the overemphasis on textbooks and increase the diversity of instructional approaches.

Recommendation 7: Eliminate tracking of students into less rigorous coursework.

Recommendation 8: Help minorities enroll and succeed in advanced STEM courses.

Recommendation 9: Establish systems to monitor student progress and provide help to struggling students.

Recommendation 10: Implement strategies to increase STEM participation and success at the postsecondary level.

Goal 3: Build school capacity to improve STEM education

Recommendation 11: Attract quality STEM teachers to high-need schools.

Recommendation 12: Provide cultural competency training to K-20 teachers and administrators.

Recommendation 13: Identify and implement successful approaches to K-12 math/science teacher preparation and professional development.

Recommendation 14: Increase incentives for K-12 teachers to complete high-quality professional development.

Recommendation 15: Develop a STEM-focused alternative certification program.

Recommendation 16: Provide professional development to K-12 school leaders in order to improve their understanding of and support of high quality science and mathematics teaching.

Goal 4: Engage business and the broader community

Recommendation 17: Evaluate the success of existing out-of-school and afterschool programs focusing on STEM.

Recommendation 18: Identify possible roles for parents, communities, industry, and government in attracting students to STEM careers.

Recommendation 19: Develop more partnerships to strengthen K-12 instruction.

Goal 5: Make Informed Policy Decisions

Recommendation 20: Require "diversity impact studies" to guide budget reductions by school districts, community colleges and state universities.

Recommendation 21: Create a board of industry representatives for lawmakers to consult when making decisions that will affect workforce education and preparation specifically in STEM fields.

RECOMMENDATIONS OF THE FEMALE-MINORITY WORK GROUP

Goal 1: Increase student interest and awareness

Recommendation 1: Launch media and outreach campaigns to raise student awareness of STEM careers. With science literacy in mind, the group considered all students the target audience for this recommendation. Several different types of activities were suggested:

1. **Identify existing promotional and marketing materials that positively portray young people, particularly females and minorities, in STEM careers.** The campaign should be based on evidence of strategies that work. Possible media outlets and resources to consider include:
    - NASA materials, such as a film showing interviews with kids.
    - Short videos called "Futures" featuring females/minorities in STEM careers.
    - Information/materials on the National Action Council for Minorities in Engineering website (www.nacme.org).
    - Hispanic and African American media outlets. Advertisement during events that are frequently viewed by women, minorities, and the general population might also be effective (i.e., Golf, Tennis, Tyler Perry, Football, American Idol, Dancing with the Stars).
    - U2 videos, the Design Squad, ipods, Internet, and other media that make it "cool" for students to pursue STEM.
    - The Southern Regional Education Board (SREB) and Southern Governors' Association received a Gates Foundation grant several years ago to launch media outreach campaigns designed to motivate all students to complete high school well-prepared to enter postsecondary education or the workforce. One component of this initiative, SREB's Go *Alliance,* helps member states share expensive media materials and run more effective campaigns promoting college awareness, access and attendance among underrepresented minorities (see http://www.collegeaccessmarketing.org/goalliance/default.aspx).
    - Existing organizations, such as Enterprise Florida, Space Florida, and Workforce Florida, Inc., to help organize or support media campaigns.
    - The ACT's online program tools through Discover to aid in raising awareness of STEM jobs. See website at http://www.act.org/discover/overview/index.html
    - Public announcements, including a State of STEM address to increase public awareness and understanding of the importance of STEM, the consequences of low achievement in STEM, the gender and racial/ethnic disparities in STEM, and solutions for closing the gaps.

2. **Target outreach for specific groups** of students such as those eligible for free/reduced price lunch and first generation college students. Find ways to attract and sustain female interest in science and mathematics. The appeal of science and math for females needs to be addressed from kindergarten through the university level. For females, it appears to be a question of keeping interest in science alive, rather than a question of ability or academic achievement.

3. **Provide students time, materials and facilities** related to STEM education and exploration of STEM careers, taking advantage of field trips, interactive exhibits, videos, laboratory workshops, and other programs at venues outside the school setting such as:
    - Museum of Science and Industry (Tampa) (http://www.mosi.org/)
    - The Orlando Science Center (http://www.osc.org/Index.aspx)
    - Boston Museum of Science – materials to train counselors and teachers; career books for children (http://www.mos.org/exhibits_shows)
    - The National Center for Quality AfterSchool Training Toolkit which provides examples of how to engage students in science, technology, math, arts, and literacy programs after school (http://www.sedl.org/afterschool/)

4. **Encourage STEM outreach at the postsecondary level.** Examine programs in Florida and other states that have been successful in attracting females and underrepresented minorities to STEM or STEM-related majors. Also, increase incentives and opportunities for tenured and tenure-track faculty to take a proactive role in recruiting and engaging students in STEM courses and majors, through teaching, research and service. Increase STEM faculty awareness of diversity by requiring them to report the number and percentage of female and traditionally underrepresented minority students engaged in their research projects.

Recommendation 2: Strengthen STEM-related counseling and advising.

1. **Staff schools with guidance or career counselors at all levels** (elementary, middle and high school) in ratios appropriate to the student population.

2. **Encourage universities to work with elementary and secondary school counselors.** For example, Florida International University's College of Engineering provided workshops that exposed counselors to different engineering disciplines. The Florida Partnership for Minority and Underrepresented Student Achievement, a joint initiative of the College Board and the State of Florida, provides a forum to address how students could be better advised on coursetaking and prepared for postsecondary success. The partnership's activities, which currently includes a counselor leadership conference, might be tailored or expanded to specifically address STEM.

3. **Increase use of career counseling tools and resources**, such as the electronic Personal Education Planner (ePEP) and other tools on the FLDOE career planning website, www.facts.org. Some tools are already in place but need to be used more widely. Career counselors, especially in high school, should be aware of financial resources and grants available to students pursuing STEM education. For example, the National Science and Mathematics Access to Retain Talent Grant, also known as the National SMART Grant (see http://studentaid.ed.gov), provides up to $4,000 per year to full-time undergraduates, who are in their third and fourth years of study, are eligible for federal Pell Grants, and are majoring in physical, life, or computer sciences, mathematics, technology, or engineering.

4. **Help STEM teachers become more like advisors.** They need to be sufficiently knowledgeable to talk to students about college and STEM careers.

5. **Engage older students in mentoring younger learners.** For example, the National Science Foundation Graduate Teaching Fellows in K-12 Education (NSF GK-12) Program (http://www.nsfgk12.org/) provides fellowships and training to graduate students in STEM fields who work in K-12 schools in a mentoring or supportive role. The purpose is to improve their communication and teaching skills while enriching STEM content and instruction for their K-12 partners. With an NSF grant, the University of South Florida's College of Engineering is creating learning communities for students through a three-tiered mentoring ladder involving faculty mentors, upper-level undergraduates, and graduate students (see http://www2.eng.usf.edu/news/kumar-nsfrnr.asp).

6. **Utilize workforce development (e.g., Workforce *plus)* counselors to familiarize students with careers.**

Recommendation 3: Increase awareness of and access to financial aid for college, particularly in STEM majors. Ensure that females and underrepresented minorities are aware of Bright Futures Scholarships, access to at least one free PSAT exam, and dual enrollment programs at universities. Consider a state-funded scholarship for university students seeking STEM degrees. For example, an extra $1500 per year in financial aid might lure more students. This strategy has been adopted in South Carolina, but no results have been reported to date. The University of Florida reportedly tried this approach at the institutional level but it was viewed as "giving other majors less."

Goal 2: Improve STEM instruction

Recommendation 4: Implement research-based instructional strategies in K-12 mathematics and science. The Work Group recommended doing for math and science what *Reading First* did

for reading in the elementary grades. It was predicted that this would be more challenging in mathematics and science than in reading because of the number of different content areas (life sciences, physical sciences, etc.).

1. **Systematically study the effectiveness of STEM education in elementary, secondary, and postsecondary schools in Florida.** One approach is to conduct a *Beat the Odds Study* targeting high minority schools in Florida to answer the following question: *How do Florida schools where minorities "beat the odds" (i.e., perform at higher levels than predicted based on socioeconomic and other factors) differ from Florida schools where minorities do not "beat the odds" ?* The intent of this study would be twofold: (1) to identify STEM-related policies and practices in Florida's schools and school districts that appear to have promise in increasing the participation and success of minorities in STEM education, and (2) to subsequently test their effectiveness through rigorous evaluations. The initial focus would be mathematics achievement in elementary schools serving a substantial number of minorities underrepresented in STEM (i.e., Blacks and Hispanics). In later years, this study could be extended to middle and high school mathematics and to science at all levels. Similar studies have been conducted in other states such as Arizona and Washington.
2. **Examine key recommendations from national organizations serving females and minorities.** Two organizations of particular relevance are the (1) National Action Council for Minorities in Engineering (NACME) which has a number of suggestions on its website (www.nacme.org) and sponsors programs and events designed to attract minorities to engineering, (2) SECME which hosts programs beginning in the early grades that encourage minorities and underserved youth to study STEM in college. The following organizations also have provided recommendations: Ecological Society of America (ESA), The National Association of Multicultural Engineering Program Advocates (NAMEPA, Inc.), Student Conservation Association (SCA), The National Society of Black Engineers (NSBE), National Organization of Black Chemists and Chemical Engineers (NOBCHE), Society of Women Engineers (SWE), National Society of Hispanic Engineers (NSHE), and the National Association of Mathematicians (NAM).
3. **Support interdisciplinary collaborations.** Provide opportunities for student exposure to multiple STEM disciplines (e.g., chemistry and engineering). For example, at some universities, departments (e.g., chemistry and engineering) share graduate students as teaching assistants for STEM courses.

Recommendation 5: Increase the rigor and relevance of course-offerings.

1. **Determine the most feasible way to increase mathematics and science course-taking requirements** at the high school level so that students take at least four years each of math and science and reach at least Algebra II in mathematics by graduation. *Revisited*, a longitudinal study by the National Center for Education Statistics tracking the 1988 cohort of U.S. 8th graders through 2000 provides data on course-taking associated with

success in postsecondary education. The data, however, are primarily correlational; a cause-and-effect relationship between increased requirements and postsecondary success has not been established. Also, the feasibility of implementing such requirements needs to be carefully considered in order to minimize implementation barriers (e.g., lack of well-qualified teachers) and possible unintended consequences (higher drop-out rates).

2. **Offer capstone courses in high school** that illustrate the application of STEM in real world and career settings. These courses would be an option for students who think Advanced Placement (AP) courses aren't "cool" or do not plan to attend college immediately after graduation. Hands-on experiential learning was suggested as a strategy to increase the relevance of instruction in grades K-12.

Recommendation 6: Reduce the overemphasis on textbooks and increase the diversity of instructional approaches (e.g., rotating students from large groups to laboratories and small problem-solving groups; use of manipulatives; and hands-on, minds-on activities, including science labs.) The Miami-Dade school district is preparing packets and laboratory activities to enhance science instruction, as a supplement to existing textbooks and guides. Other examples include: (1) Supplementary science and math resources such as Great Explorations in Math and Science or GEMS at the University of California-Berkeley, (2) I LOVE Science (Increasing Local Opportunities for Volunteers Enthusiastic about Science) created by a partnership between Gulf Power Company, Florida Institute for Human and Machine Cognition (IHMC), former state Rep Holly Benson, and the Escambia and Santa Rosa County School Districts, and (3) the MOVE IT Math (MIM) program by Project GRAD USA Mathematics.

Recommendation 7: Eliminate tracking of students into less rigorous coursework. Eliminate low track courses such as Informal Geometry and Algebra IA/IB. Identify "weed-out" courses and provide support to students struggling in these courses. Do not isolate students based on language. STEM courses and activities should be structured to remove barriers and include students with limited English Proficiency. Testing accommodations will help these students to some extent, but they also will need help in their native language with technical vocabulary in science and mathematics, which may be unfamiliar or confusing to their parents.

Recommendation 8: Help minorities enroll and succeed in <u>advanced</u> STEM courses.

1. **Evaluate existing programs in Florida and other states and identify those that might be scaled up.** Examples include:
    - **AVID** (Advancement Via Individual Determination): Miami-Dade is currently piloting this program, which begins in grade 4 and extends through middle and high school. It includes rigorous coursework school-wide, tutoring in Socratic

methods, writing as a tool for learning, study groups, and exposure to the wider world through attendance at stage plays, museums and places of professional employment. Although taught by different teachers, each middle school student has a single teacher responsible for him/her. A major target group for this program is "middling" or "C" students who regularly attend school and do not have serious discipline problems. Other Florida districts, such as Brevard and Hillsborough, also have been implementing this program. (See http://www.avidonline.org/)

- **Dual community college and university degree programs**: Florida International University (FIU) operates a program specifically for students who are not admitted to FIU immediately after high school graduation, but who would be automatically eligible for admission upon successful completion of an AA degree at a community college within 3 years. Upon entry to the community college, the program builds the student's psychological connection with the university, for example, by giving them an FIU ID card, access to the FIU library, discounts for football game tickets. Findings to date indicate better results for these dual degree program participants compared to those students who were offered but did not accept this opportunity.

2. **Examine proper designation of advanced courses.** The Work Group raised concern about use of the terms "Pre-Advanced Placement (Pre-AP)" versus "Honors" in naming high school courses, and the differential impact these designations may have on student enrollment in AP courses. The term "pre-AP" may encourage students to enroll in AP courses, whereas the term "Honors," by signifying excellence that may not be on par with AP courses, may deter students from taking AP courses. Proper designation and description of courses also is needed at the university level to help students pursue STEM careers, particularly in information technology.

3. **Encourage school administrators to monitor the number of females and minorities in higher level courses** and consult with teachers and parents about the possible reasons for low female and minority enrollments (if any) and how they might be increased.

Recommendation 9: Establish systems to monitor student progress and provide help to struggling students. Such a system would have academic interventions at mid-term for those with borderline or poor performance. For example, at the university level, University of South Florida students receive mid-term grades and are required to see an advisor and counselor if performance is below an acceptable threshold. Conduct surveys on student attitudes towards STEM that could identify school, home and peer factors that influence students' STEM choice and persistence in high school and their transition into college and the workforce. The Michigan Study of Adolescent and Adult Life Transitions or MSALT provides a good model to follow.

Recommendation 10: Implement strategies to increase STEM participation and success at the postsecondary level.

1. **Implement research-based remediation strategies.** Recent studies by the Florida Legislature's Office of Program Policy Analysis and Government Accountability (OPPAGA, Report No.07-31) and Association of State Colleges and Universities *(Enhancing college student success through developmental courses)* indicate that successful completion of college preparation programs and developmental coursework can improve degree attainment. The OPPAGA report notes that although research-based strategies exist, they are implemented unevenly by community colleges.

2. **Improve vertical integration of mathematics and science education from K-20.** To enhance student success and reduce the need for remediation, the workgroup advised better alignment of STEM coursework and instruction from K-12 to the postsecondary institutions and from community colleges to universities.

3. **Implement strategies to enhance attainment of bachelor's and advanced degrees.** Consider pre-major STEM degrees (similar to pre-law or pre-med programs). Examine the possibility of extended five-year master's degree programs in STEM fields that afford students the opportunity to increase their preparation for master's level coursework.

4. **Increase research experiences** for grade 3-12 students and undergraduates in order to engage students in the work of scientists in various STEM fields.

5. **Find ways to retain STEM college and university majors in STEM or STEM-support fields.** When students drop a particular STEM major, provide a mechanism to redirect them to another STEM or STEM-support field for which they may be better suited. Encourage STEM learning and community living centers at universities to increase student experience with and exposure to STEM fields and facilitate interaction among students with similar STEM interests.
6. **Consider English proficiency courses for professors in STEM fields.** At Florida International University, accent reduction courses are given to professors when student evaluations indicate that teachers are difficult to understand.

Goal 3: Build school capacity to improve STEM education

Recommendation 11: Attract quality STEM teachers to high-need schools.

1. **Review and evaluate the effectiveness of incentive programs** in Florida and other states which aim to attract and retain practicing teachers at Title I or other low SES schools.

2. **Utilize incentives to attract pre-service teachers to high need schools.** Examples include (1) federal Teacher Education Assistance for College and Higher Education (TEACH) Grants that provide up to $4,000 per year to students who agree to teach in a public or private elementary or secondary school that serves students from low-income families, and (2) the Florida Fund for Minority Teachers, established in 1999 by the Florida Legislature, which provides $4,000 scholarships to eligible African-American, Hispanic-American, Asian-American, and Native American juniors enrolled in a teacher education program at one of Florida's public or private universities. These scholarships can be repaid by being employed as a Florida public school teacher for one year for each year the scholarship was received.

3. **Broaden teacher recruitment efforts for high need schools** via local universities such as Colleges of Education, Arts and Sciences, and Engineering. Expand efforts to recruit career changers with STEM backgrounds into mathematics and science teaching. Arrange more internships for pre-service teachers in high-need schools and at schools with critical shortages of mathematics and science teachers.

Recommendation 12: Provide cultural competency training to K-20 teachers and administrators. It is important for teachers to be aware of actions that may unfairly track minority/female students or restrict them from getting into upper level classes. Also, leaders must be able to foster cultural competency among teachers and create a comfort zone that will enable people to have open conversations about race. Both teachers and administrators must understand the unique cultural aspects of minority populations that may dissuade students from pursuing STEM careers. For example in the Hispanic culture, females may have deeply rooted roles that differ from those of males. Parents may be reluctant to encourage their children to enter unfamiliar fields or to live far away from home. The Anchin Center at the University of South Florida (USF) has incorporated cultural competency training into professional development for science educators. The National School Reform Faculty Protocols provide guidance on how to have difficult conversations with faculty about race and other issues. Some school districts, such as Hillsborough and Pinellas, have provided cultural competency training on a broad scale. At the university level, cultural competency training (like sexual harassment training) could be required for faculty.

Recommendation 13: Identify and implement successful approaches to K-12 math/science teacher preparation and professional development. Both content and pedagogy (strategies for teaching content) need improvement at all levels. With grants from the National Math and Science Initiative, two Florida universities (University of Florida and Florida State University) are replicating and evaluating the impact of the UTeach teacher preparation program at the University of Texas-Austin. This program was designed to dramatically increase the number of well-qualified mathematics and science teachers at the secondary level. For practicing teachers,

the Work Group suggested that professional development follow a professional learning community model and engage teachers in Lesson Study (an approach in which teachers are convened to discuss how to teach a particular lesson, develop a script, observe each other teach, and refine the lesson accordingly).

Recommendation 14: Increase incentives for K-12 teachers to complete high-quality professional development. One option is to examine in-service points for recertification and place greater emphasis on STEM content. Incentives could be provided for teachers to complete courses/degrees at universities. Some universities, such as Florid State University, offer practicing science teachers the option of earning a master's degree online and summer programs, such as Research Experiences for Teachers (RET) that pay teachers stipends to work with scientists.

Recommendation 15: Develop a STEM-focused alternative certification program, possibly integrated with other programs, such as MINT (Mentoring and Induction for New Teachers) directed by the Miami-Dade County School District.

Recommendation 16: Provide professional development to K-12 school leaders in order to improve their understanding and support of high quality science and mathematics teaching.

Goal 4: Engage business and the broader community

Recommendation 17: Evaluate the success of existing out-of-school and after-school programs focusing on STEM. The Northwest Regional Educational Laboratory published a literature review on the importance of afterschool literacy programs for the National Partnership for Quality Afterschool Learning. It was suggested that a similar literature review be conducted on STEM afterschool and outreach programs incorporating the programs below.

Examples:

- **SECME.** Established in 1975 as the Southeastern Consortium for Minorities in Engineering by the engineering deans at seven southeastern universities, this organization sponsors programs for students, teachers and parents with the aim of increasing the numbers of underrepresented and underserved students who want to study science, mathematics, engineering and technology in college. SECME's programs start as early as pre-kindergarten and extend through high school (see www.secme.org). The Georgia Institute of Technology would have data on the success of this program. The Miami-Dade school district, University of Miami and Florida International University also have been involved in SECME initiatives.

- **California MESA** (Mathematics Engineering Science Achievement). Established in 1970 and administered by the State of California, MESA is an academic development program that supports educationally disadvantaged students in math and science studies at the university level and their attainment of math-related degrees in engineering, science and technology. The program is funded by the state legislature, corporate contributions and grants (see http://www.ucop.edu/mesa/home.html).
- **Upward Bound Math-Science (UBMS).** In 1990, the U.S. Department of Education established a math and science initiative within Upward Bound, designed to provide disadvantaged high school students with skills and experiences to help them succeed in college. The UBMS initiative awards grants to colleges and universities to provide (1) hands-on experience in laboratories, computer facilities, and at field sites, and (2) opportunities to learn from mathematicians and scientists at host institutions. An evaluation of student transcripts collected between 1998 and 1999 and again from 2001 to 2002 indicated that UBMS improves several student outcomes in high school and college, and increases the odds of majoring in math or science (Olsen et al, 2007).
- **Summer STEM programs and academies for students.** These experiences appear to increase students' interest in STEM. A variety of these programs are offered by Florida's universities. Examples include "Expanding Your Horizons" a STEM-related program for middle school girls sponsored by the University of Central Florida's College of Engineering and Computer Science, "Saturday-at-the-Sea" sponsored by Florida State University's College of Arts & Sciences, and "Science Students Together Reaching Instructional Diversity & Excellence" (SSTRIDE) sponsored by Florida State University's College of Medicine. At Florida International University, the College of Engineering conducts outreach programs during the school year and summer months to prepare young students in science, technology, engineering, and mathematics.

Although the following programs are not STEM-specific, they offer opportunities for promoting STEM education and careers to female and minority students.

- **Engaging Latino Communities for Education (ENLACE).** Launched nationally by the W.K. Kellogg Foundation in 1999, ENLACE (Engaging Latino Communities for Education) builds educational partnerships to identify and eliminate the barriers to educational success in higher education for diverse under-represented students. The W. K. Kellogg Foundation has funded a joint proposal by Florida International University, University of South Florida , Florida Atlantic University, and the University of Central Florida over three years to support ENLACE FLORIDA. This project will develop and implement solutions eliminating barriers to educational success, examine best practices in Florida and the nation and advocate for policies designed

to improve educational achievement for Hispanic students and other under-represented groups in Florida's K-20 system. (See http://www.cec.fiu.edu/news/CEC_News_ENLACE.htm)

- **College Reach-Out Program (CROP).** Funded by the Florida Department of Education, this program has served over 112,000 students since 1990. Blacks comprise the largest group served (72%); also, females (61%) outnumber males. The program starts at 6th grade and runs through graduation. Results to date show that 85% of seniors in the program graduate from high school with a standard diploma and 72% of graduates enter postsecondary institutions. Most of the state's community colleges and state universities plus 4 private institutions participate. Districts sign agreements with participating postsecondary institutions. For more information see http://www.fldoe.org/eeop/crop.asp.
- **"High Schools That Work."** High Schools That Work is the largest and oldest of the Southern Regional Education Board's school improvement initiatives for high school and middle grades leaders and teachers. More than 1,200 *HSTW* sites in 32 states participate. (See http://www.sreb.org/programs/hstw/hstwindex.asp.) This national academy model is being implemented in all high schools in Miami-Dade, which have focused on the following themes: Health Sciences, Finance, Law, Digital Technology, among others.
- **GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs).** This federally-funded grant program is designed to increase the number of low-income students who are prepared to enter and succeed in postsecondary education. It provides six-year grants to states and partnerships to provide services to students at high-poverty middle and high schools. Entire cohorts of students are followed from middle to high school. GEAR UP funds also provide college scholarships to low-income students. There are four GEAR UP projects in Florida (See http://www.ed.gov/programs/gearup/index.html.

In examining and assessing the effectiveness of these programs, the Work Group suggested comparing them on a given set of characteristics (e.g., parental support) and looking for common characteristics that define successful programs, recognizing that no one particular model should be expected to work in all contexts.

The Work Group also suggested examining programs designed to help students develop skills and coping strategies (persistence, time management, study habits) necessary for the transition from high school to college and graduate school. Examples of these programs are freshman First Year Experience (FYE) courses, the Ronald E. McNair Post-baccalaureate Achievement Program (a federal TRIO program) for underrepresented minorities, the National Science Foundation's Louis Stokes Alliance for Minority Participation or AMP program to help underprivileged minorities in STEM, and summer bridge programs.

Recommendation 18: Identify possible roles for parents, communities, industry, and government in attracting students to STEM careers.

1. **Help students find mentors or supportive adults** who can guide their education and development. The national Hispanic Dropout Project established by the U.S. Department of Education in 1995 identified the importance of social networks and supports: Students must have parents who know what it takes to succeed or a supportive relationship with a member of the school staff.

2. **Disseminate information to parents about how to support their children's STEM education and choice of STEM careers.**
   The Work Group noted that parents are a huge lever for Hispanic students. Hispanic families are very close-knit (70% to 80% of Florida International University students live at home) and are reluctant to see their children leave home for employment elsewhere. These concerns should be addressed in communications with parents and students about STEM careers, for example, by describing where people with STEM degrees work locally. Family-centered math and science activities also were mentioned as options for communicating with parents about STEM education and careers. Examples include the (1) Everyday Mathematics Center funded by the NSF to support educators, parents, and students who use Everyday Mathematics, (2) Figure This! Math Challenges for Families, (3) MAPPS (Math and Parent Partnerships) in the Southwest, and (4) STEM Family Nights.

2. **Examine various avenues for outreach** such as churches, community centers, fraternities and sororities, neighborhood functions, ethnic festivals, Math/Science at the Mall, Spanish language talk shows, the Miami-Dade parents academy, parent resource rooms (currently at all Miami-Dade schools), 100 Black Men, and town hall meetings hosted by Miami-Dade school board members (which typically have a large turnout). Providing outreach to American Indian students and families would require building trust, perhaps through meetings with tribal leaders, and a message that resonates with their culture, including a connection to the land.

3. **Better inform parents of financial aid options for college**, such as Bright Futures Scholarships, free PSAT exams for students, the Florida International University's dual enrollment program with community colleges (described on pp. 12-13). The poor are less willing to take on debt than middle and upper income families. The subprime mortgage crisis and economic downturn is likely to exacerbate this problem.

4. **Engage school administrators, school board members and business/industry in outreach.** Prepare a kit with data and materials that will equip them to tell the story. Develop relationships with organizations such as Disney, Scripps, NASA, and the National High Magnetic Field Laboratory.

5. **Find out what businesses are doing to attract females and minorities into STEM education and STEM fields.** The group discussed two related activities: (1) setting up a database for matching students with business internships, and (2) starting a state recognition program for business initiatives. It also was suggested that Workforce Florida target STEM Education as one of its target industries and partner with K-12 and postsecondary institutions to align STEM education with industry needs.

Recommendation 19: Develop more partnerships to strengthen K-12 instruction. Involve business and industry in providing professional development for K-12 teachers for example, by sponsoring a teacher or engaging teachers in R&D activities. Some corporations in Florida, such as Lockheed-Martin, have been involved in these efforts. Florida PROMiSE is an example of a statewide professional development partnership of universities and school districts recently funded by the Florida Department of Education with federal monies. Partnerships in other states, regions or districts might inform how partnerships can accomplish different purposes and meet local or regional needs. The state should consider (1) competitive funding of partnerships among one of more districts and a university, and (2) tax and other incentives for STEM-related industries in Florida to recruit and mentor female and minority students.

Goal 5: Make Informed Policy Decisions

The Work Group believed that increasing and sustaining policymakers' support for STEM education is critical to any plan to increase the participation and success of females and minorities. They suggested enlisting the support of female and minority legislators and involving STEM-related businesses and industry in lobbying for improving student financial aid, programs, and initiatives.

Objective 20: Require "diversity impact studies" to guide budget reductions by school districts, community colleges and state universities. The purpose of these studies would be to assess the expected impact of budget cuts under consideration on females and minorities before the decision is made. The Work Group's concern was that administrators or decision-makers, in response to state budget cuts, are eliminating or reducing funding for specific programs or services without awareness of the differential impact these actions will have on female and minority students. For example, decreasing the number of community college transfers to a university could have a disproportionate impact on the admissions of females, Blacks and Hispanics.

Objective 21: Create a board of industry representatives for lawmakers to consult when making decisions that will affect workforce education and preparation, specifically in STEM fields.

ACTIONS SUPPORTED BY RESEARCH

It is imperative that policymakers and educators at the state and local level are aware of evidence-based solutions to improve the educational outcomes of female and minority students. These outcomes include participation, achievement, choice, and persistence in STEM courses, majors, and careers -- including narrowing of the gender and racial gaps in these areas. The purpose of this section is to outline interventions (i.e., programs, policies and other strategies) that target these outcomes and are supported by research in mathematics and science education, sociology, economics, and psychology.

The interventions fall into two categories: (1) *universal interventions* intended for all students, and (2) *targeted interventions* focused on specific student populations. According to Willms (2006), universal and targeted interventions are critical to improve the educational outcomes of all students while narrowing the inequalities between female and male students, minority and white students, and students from low and high socioeconomic status (SES) households.

Levels of evidence

Educators are faced with a wide variety of options when choosing interventions to implement in their schools and classrooms. Before investing time and resources in a course of action, however, it is important to consider the weight of the evidence supporting an intervention's effectiveness. Some, despite widespread use, have not been tested at all. Others have been evaluated or researched but with varying levels of scientific rigor.

According to the Coalition for Evidence-Based Policy (2003), randomized controlled trials, in which program participants are randomly assigned to treatment (intervention) and control groups, provide the strongest evidence of effectiveness. Random assignment maximizes our ability to eliminate factors other than the intervention as an explanation for a program's effect. It gives us a high degree of confidence that the groups vary in only one respect -- the intervention -- not in prior levels of achievement, demographics or other characteristics that we are not able to observe or measure. Without random assignment, it would be very difficult to separate the effect of the intervention from the characteristics of the participants.

Studies with well-matched control and comparison groups, although not as conclusive, can provide a moderate level of evidence. For example, students in treatment and control groups might be matched on prior achievement, race, and socioeconomic status. Matching, however, cannot eliminate rival explanations of a program's effect that might be attributable to other factors or individual characteristics, such as personal motivation or family encouragement, that are difficult to measure.

Correlational research describes the direction and strength of a relationship between two variables. For example, the number of advanced mathematics courses taken in high school is positively correlated with postsecondary success. High levels on the first variable are associated with high levels on the second. However, correlation is not causation. Higher student achievement could be due to factors other than course-taking. For example, advanced mathematics courses may tend to be offered in high schools where students' parents have high incomes and educational levels. Also, students encouraged or motivated to enroll in advanced mathematics courses are likely to be high achievers. Correlational research can help design interventions that can be subsequently tested through causal research, but it cannot be the basis for cause-and-effect conclusions.

When discussing interventions, this report will distinguish between findings that are supported by causal versus correlational research. The latter are abundant in the research literature, and must be interpreted with caution.

Universal Interventions

The objective of universal interventions is to improve the educational outcomes (i.e., participation, achievement, choice, and persistence) of all students within the schooling system regardless of race, gender, SES, level of achievement, or other individual characteristics (Willms, 2006). Universal interventions are system-wide reforms applied uniformly and consistently within all school districts and across all schools. Typically, these reforms either modify the curriculum, instructional techniques of teachers, or the structure of the school (Willms, 2006). In the context of the aims of the Female-Minority Initiative, universal interventions represent reforms that specifically occur in the classroom and modify teacher behavior and classroom instructional practices related to STEM. These reforms benefit all students including females and minorities. Below is a list of universal interventions based on causal and correlational research as well as recommendations from the Female-Minority Initiative work group.

Praise the STEM effort of students. Causal research indicates that students have positive beliefs about their STEM abilities when teachers praise their efforts instead of praising their abilities, and when teachers help students understand that intelligence is incremental and malleable based on their efforts and learning. Students with these beliefs maintain stronger learning goals, use effort-based strategies to respond to challenges or failure (e.g., persist on challenging tasks), exhibit higher STEM achievement, take more STEM courses, and are more likely to choose STEM majors in college (Mueller & Dweck, 1998; Blackwell et al., 2007).

Use instructional activities that arouse greater student interest in STEM. Causal research indicates that students have greater interest and achievement in STEM when teachers contextualize, personalize, and diversify instruction with multimedia,

technology-assisted instruction, hands-on inquiry, project-based learning, and small within-classroom student groupings that facilitate learning (Parker & Lepper, 1992; Cordova & Lepper, 1996; Renninger et al., 2002; Schneider et al., 2002; Turner & Lapan, 2005; Bottge et al., 2007; Randler & Hulde, 2007).

Provide motivational support and feedback to students. Correlational findings suggest that motivational support and frequent, elaborative, positive, and helpful feedback from teachers has a strong and positive relationship with increases in student motivation in STEM (Turner et al., 2002; Schweinle, Turner, & Meyer, 2006).

Targeted Interventions

Targeted interventions are policies, programs and other activities designed to improve the educational and non-educational outcomes of specific and selected populations, such as females, minorities, students with disabilities, students with limited English proficiency, and students from low-income families. There are three types of targeted interventions (Willms, 2006). In some circumstances, they overlap in terms of selected population or desired outcomes.

- *SES-targeted interventions* provide specialized instructional resources to improve the educational outcomes of students from selected households (e.g., minority, low-income)
- *Performance-targeted interventions* seek to improve the educational outcomes of students by providing special instruction, curriculum, or resources to targeted students based on their levels of academic achievement.
- *Compensatory interventions* indirectly improve the educational outcomes of students by providing economic resources directly to the household.

Below is a list of targeted interventions that show promise based on correlational research. No causal research evidence on targeted interventions was found.

Create incentives for the hiring and retention of experienced, effective mathematics and science teachers in low-performing schools that often serve a high proportion of minority and low-income students. Correlational findings indicate that minority, low SES, or low achieving students are more likely to have inexperienced and ineffective mathematics and science teachers (Sanders & Horn, 1998; Clotfelter et al., 2005).

Provide more gift aid to minority and low SES students, and better inform these students of available financial aid. Correlational research suggests that student selection, participation, and persistence in STEM courses and majors correlate with the amount of gift aid available at higher education institutions (Bettinger, 2004; Hu, 2008).

Encourage parents of minority students to have greater involvement in the STEM education of their children. Correlational findings suggest that minority students with parental involvement, despite coming from lower income households, have STEM achievement as high as White students with similar levels of parental involvement (Yan, 1999; Jeynes, 2003).

LOGIC MODELS

Logic models identify the contexts, inputs, outputs, and activities and how they are expected to produce desired outcomes:

- Increased STEM learning and achievement
- Increased selection of STEM majors and careers
- Greater persistence in STEM majors and careers
- Narrowed gender and racial/ethnic achievement gaps

For this project, two logic models were prepared. The practitioner model thinks theoretical elements supported by the Female-Minority Initiative Work Group. The research-based logic model shows linkages between elements that are supported by causal research.

The Practitioner-Based Logic Model presents the perspective of practicing teachers, administrators, university faculty and other Work Group members on inputs, activities and outputs that will lead to desired outcomes. The inputs (i.e., stakeholders, major players, or guidelines) that affect the overarching goal to improve outcomes for females and students of color in STEM or STEM-Support (e.g., health) courses and careers include:

- **Student.** Refers to females and under-represented minorities with an interest and aptitude for STEM or STEM support fields. At the postsecondary level, both traditional (full-time) and non-traditional (part-time, older) students are included.
- **Policies and Guidelines.** Includes laws, policies, procedures, and processes that affect the creation, resources, monitoring, assessment, and evaluation of STEM activities.
- **Resources.** Includes federal, state, local and private monies for funding activities in the systems logic model.
- **Programmatic Infrastructure.** Includes current STEM programs/providers/and capacity to provide quality services and resources. Also includes schools districts, institutions of higher education and professional organizations.
- **Business/Community.** Includes STEM employers, foundations, and other non-profit or faith-based organizations.
- **Neighborhood/Family Support.** In-home parent assistance, family time and resources, supports provided by parent-teacher organizations, and neighborhood resources supporting high expectations.
- **Educators.** Refers to principals, assistant principals, teachers, guidance counselors, district, state, and local representatives, department chairs, deans and other key position holders that direct or impact schools, colleges, and universities.
- **Support Infrastructure.** Refers to leadership, research, and other resources that can be used to: (1) set policies, goals, and priorities, (2) inform decision-making, and (3) make systemic improvements.

One, several, or all of the inputs can affect the activities (i.e., programs and other efforts) designed to produce desired outputs. Example of these activities include after school, out of school, and outreach programs, professional development for educators in mathematics and science content and cultural competence, preparation of highly skilled guidance counselors and mentors, and initiatives to increase access to student financial aid.

The goal of activities is to produce outputs, individually or in combination which, in turn, would be expected to produce the ultimate impacts or outcomes that the State of Florida is trying to achieve. The model provides STEM-related outputs for (1) students, (2) administrators, faculty, and guidance counselors, as well as (3) an "other" category which includes increased workforce alignment, STEM legislation, strategic planning and management, adult and peer support, and the research base on STEM issues.

Finally, there are three main impacts of this initiative, which refer to the desired results of the program, a combination of programs, or targeted efforts:

1. to increase STEM learning and achievement,
2. increase the number of students who chose STEM majors, and
3. increase the number of students that persist in STEM majors and careers.

If these targeted outcomes are achieved at a high rate for females and underrepresented minorities, the ultimate goal of narrowing and eliminating gender, racial, and ethnic gaps in STEM will be achieved. In order to examine both intended and unintended impacts, the Work Group strongly suggested that all efforts (activities, outputs and impacts) be monitored through a well structured assessment, evaluation, and feedback system. The Work Group brainstormed possible measures that could be used by the state, districts or individual schools for this purpose. A list is provided in Appendix D.

The Logic Model Supported by Rigorous Causal Research reflects the same desired impacts as the practitioner-based model and how they would be achieved. However, this model diagrams only those connections between context, inputs, outputs, and impacts that are supported by causal research. By definition, this model is constrained by the limited amount of research that has been conducted in the field and the fact that most of the available research is correlational rather than causal.

The context refers to the primary stakeholders within the educational system and their roles in addressing the female and minority STEM disparity. The stakeholders include the following: (1) Florida Department of Education, (2) Public and private universities and community colleges, (3) Florida's school districts, and (4) schools. It is suggested that these entities and their associated personnel provide the policies, rules and regulations, resources, and training (pre-service and in-service) to support STEM teachers as they work to decrease the female and minority STEM

disparity. The research suggests that the interactions between teachers and students, parents and other stakeholders further improve teacher practice and, in turn, educational benefits to students.

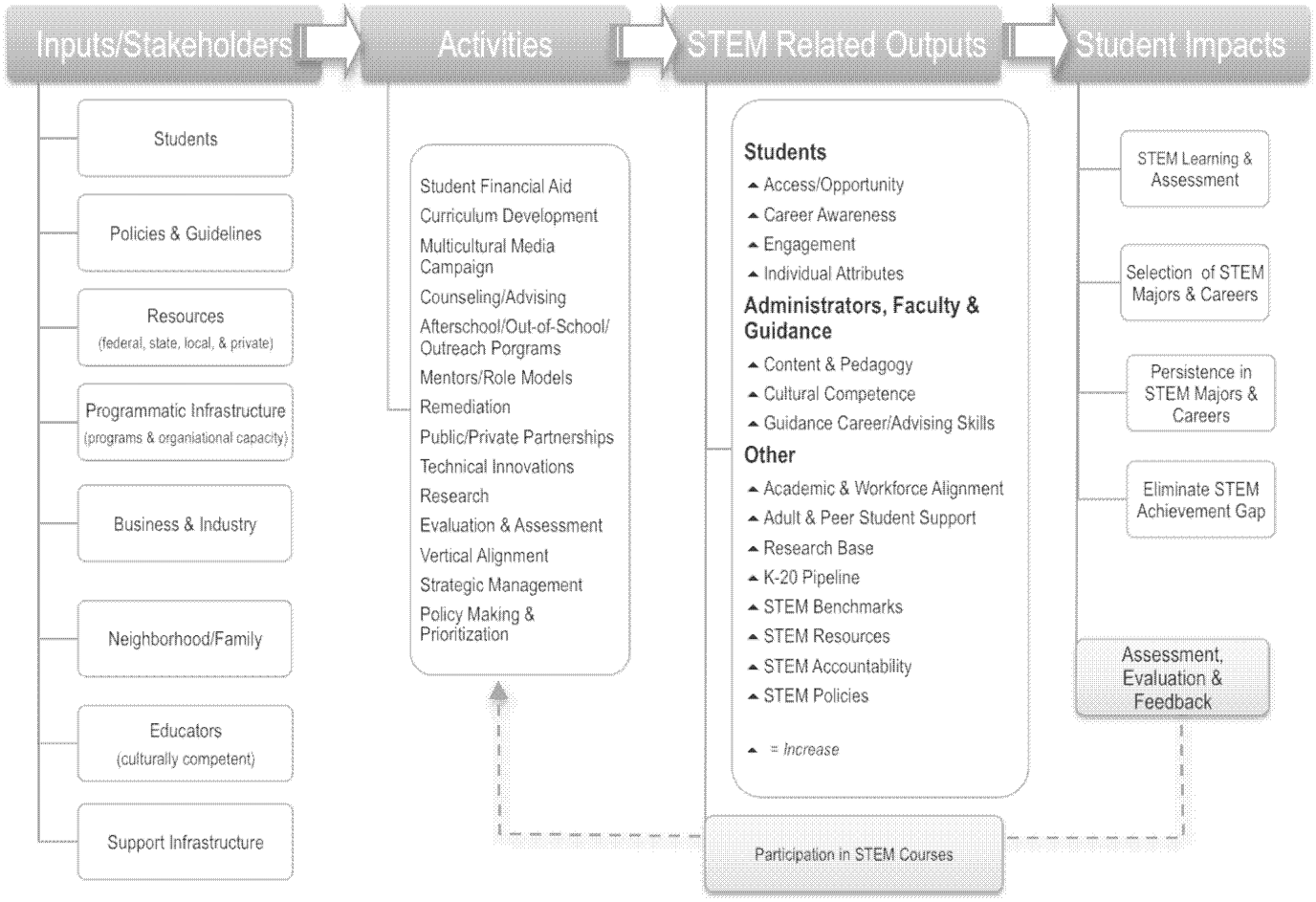
Teacher activities refer to the research-based and school-based interventions that have an effect on the female and minority STEM achievement: (1) Teachers praise the STEM efforts of female and minority students; (2) Teachers contextualize instruction by embedding it in interesting and relevant contexts, such as fantasy, sports, real-world problems, etc.; (3) Teachers use technology-assisted instruction, such as web-based, animated, and video-based presentations of STEM content; and (4) Teachers use hands-on inquiry, project-based learning, and small within-classroom student groupings that facilitate learning.

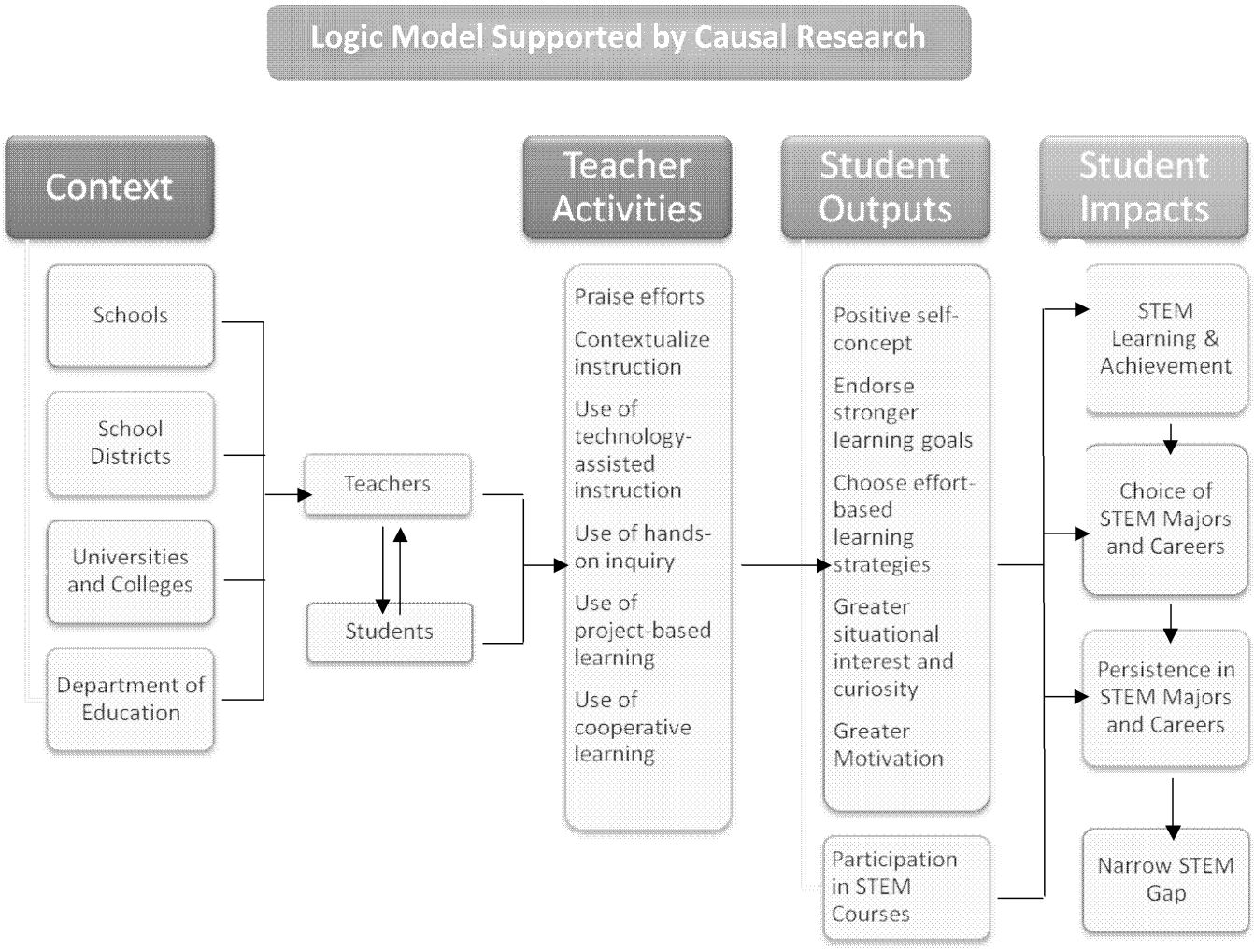
The results of these research-based and school-based interventions by teacher are the following student outputs:

- Female and minority students have a positive self-concept of STEM achievement.
- Female and minority students endorse or establish stronger learning goals or expectations.
- Female and minority students choose effort-based learning strategies when struggling with STEM (e.g., persisting on challenging tasks).
- Female and minority students have greater situational interest and curiosity concerning STEM.
- Female and minority students have greater motivation.
- Female and minority students participate or enroll in more STEM courses.

The ultimate impacts for females and minorities are increased STEM learning and achievement, choice of STEM majors and careers, and persistence in STEM fields. The research indicates that approaches based on this model are likely to narrow gender, racial/ethnic gaps in STEM.

Practitioner-Based Logic Model




Logic Model Supported by Causal Research
Context
Schools
School Districts
Universities and Colleges
Department of Education
Teachers
Students
Teacher Activities
Praise efforts
Contextualize instruction
Use of technology-assisted instruction
Use of hands-on inquiry
Use of project-based learning
Use of cooperative learning
Student Outputs
Positive self-concept
Endorse stronger learning goals
Choose effort-based learning strategies
Greater situational interest and curiosity
Greater Motivation
Participation in STEM Courses
Student Impacts
STEM Learning & Achievement
Choice of STEM Majors and Careers
Persistence in STEM Majors and Careers
Narrow STEM Gap

NEXT STEPS

Currently, the limited amount of research, particularly causal research, constrains the development of a definitive road map for improving the participation and success of females and minorities in STEM fields. More research is needed to provide policymakers and educators with the solutions to improve the STEM educational outcomes of female and minority students.

When feasible, randomized controlled trials should be conducted to determine the effectiveness of interventions; at the very least studies with well-matched treatment and control groups should be conducted. Correlational and qualitative studies could be used to design promising interventions that subsequently can be tested through university research projects or local evaluations.

Researchers should use Florida's rich education data to increase understanding of STEM-related trends and patterns beyond descriptive reports published by the Florida Department of Education.

School districts, colleges, universities and other organizations in Florida are conducting STEM-related programs, policies and activities within and outside K-20 educational institutions. These interventions need to be evaluated for impact and cost-effectiveness.

Some schools may be effectively addressing the educational outcomes of female and minority students. However, we know very little about these schools, what they are doing, and what Florida can do to duplicate their success in struggling schools. To achieve this end, FCR-STEM suggested, and the Female-Minority Initiative Work Group supports, a "Beat the Odds" study. This study would address what programs, policies and other interventions differentiate schools where minorities succeed in mathematics and science versus schools where they do not. Findings would inform the design of interventions that could be evaluated by local school districts or rigorously tested through randomized control trials conducted by universities.

Prior to executing any of this report's recommendations on a large scale, it is necessary to consider existing efforts and their impacts, associated costs, unanticipated consequences, and private and public returns. The current economic recession has increased the urgency to improve STEM educational outcomes of females and underrepresented students of color. Achieving this goal will require long-term investment of public resources in cost-effective and scalable solutions.

REFERENCES

American School Counselor Association (2008). *Student-to-counselor ratios.* Retrieved on November 15, 2008 at http://www.schoolcounselor.org/content.asp?contentid=460

Bettinger, E. (2004). How financial aid affects persistence. In C. M. Hoxby (Ed.), *College choices: The economics of where to go, when to go, and how to pay for it*. Chicago: University of Chicago Press.

Blackwell, L., Trzesniewski, K., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development, 78*(1), 246-263.

Bottge, B. A., Rueda, E., Serlin, R. C., Hung, Y., & Kwon, J. M. (2007). Shrinking achievement differences with anchored math problems: Challenges and possibilities. *The Journal of Special Education, 41*(1), 31-49.

Clotfelter, C. T, Ladd, H. F., & Vigdor, J. (2005). Who teaches whom? Race and the distribution of novice teachers. *Economics of Education Review, 24*(4), 377-392.

Coalition for Evidence-Based Policy (2003*), Identifying and Implementing Educational Practices Supported by Rigorous Evidence: A User Friendly Guide.* Retrieved January 10, 2009 from http://www.ed.gov/rschstat/research/pubs/rigorousevid/rigorousevid.pdf

Cordova, D., & Lepper, M. R. (1996). Intrinsic motivation and the process of learning: Beneficial effects of contextualization, personalization, and choice. *Journal of Educational Psychology, 88*(4), 715-730.

Hu, S. (2008). *Merit-based financial aid and student pathways to the baccalaureate degree in science and engineering*. Paper presented at the annual forum of the Association for Institutional Research (AIR), May, Seattle, WA.

Institute of Education Science. (2003). *Identifying and implementing educational practices supported by rigorous evidence: A user friendly guide.* Washington D. C.: Institute of Education Science.

Jeynes, W. H. (2003). A meta-analysis: The effects of parental involvement on minority children's academic achievement. *Education and Urban Society, 35*(2), 202-218.

Lee, V. E., Croninger, R. G., & Smith, J. B. (1997). Course-taking, equity, and mathematics learning: Testing the constrained curriculum hypothesis in U.S. secondary schools. *Educational Evaluation and Policy Analysis, 19*(2), 99-121.

Mueller, C. M., & Dweck, C. S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology, 75*(1), 33-52.

National Research Council. (2002). *Scientific research in education*. Washington D.C.: National Academy Press.

National Center for Education Statistics (2006). Overview of public elementary and secondary students, staff, schools, school districts, revenues, and expenditures: School year 2004-2005 and fiscal year 2004. Retrieved on November 3, 2008, at http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007309

Olsen, R., Seftor, N., Silva, T., Myers, D., DesRoches, D., & Young, J. (2007). Upward Bound Math-Science: Program description and interim impact estimates. U.S. Department of Education Office of Planning, Evaluation and Policy Development. Retrieved October 15, 2008, from http://www.ed.gov/rschstat/eval/highered/upward-math-science/complete- report.pdf.

Parker, L., & Lepper, M. R. (1992). Effects of fantasy contexts on children's learning and motivation: Making learning more fun. *Journal of Personality and Social Psychology, 62*(4), 625-633.

Randler, C., & Hulde, M. (2007). Hands-on versus teacher-centred experiments in soil ecology. *Research in Science &Technological Education, 25*(3), 329-338.

Renninger, K. A., Ewen, L., & Lasher, A. (2002). Individual interest as context in expository text and mathematical word problems. *Learning and Instruction, 12*(4), 467-491.

Sanders, W. L., & Horn, S. P. (1998). Research findings from the Tennessee value-added assessment system (TVAAS) database: Implications for educational evaluation and research. *Journal of Personnel Evaluation in Education, 12*(3), 247-256.

Schneider, B., Carnoy, M., Kilpatrick, J., Schmidt, W. H., & Shavelson, R. J. (2007). *Estimating causal effects using experimental and observational designs*. Washington D.C.: American Educational Research Association.

Schneider, R. M., Krajcik, J., Marx, R. W., & Soloway, E. (2002). Performance of students in project-based science classrooms on a national measure of science achievement. *Journal of Research in Science Teaching, 39*(5), 410-422.

Schweinle, A., Turner, J. C., & Meyer, D. K. (2006). Striking the right balance: Students' motivation and affect in elementary mathematics. *The Journal of Educational Research, 99*(5), 271-290.

Trusty, J. (2002). Effects of high-school course taking and other variables on choice of science and mathematics college majors. *Journal of Counseling & Development, 80*(4), 464-474.

Turner, J. C., et al. (2002). The classroom environment and students' reports of avoidance strategies in mathematics: A multimethod study. *Journal of Educational Psychology, 94*(1), 88-106.

Turner, S. L., & Lapan, R. T. (2005). Evaluation of an intervention to increase non-traditional career interests and career-related self-efficacy among middle-school adolescents. *Journal of Vocational Behavior, 66*(3), 516-531.

Yan, W. (1999). Successful African American students: The role of parental involvement. *Journal of Negro Education, 68*(1), 5-22.

Willms, J. D. (2006). *Learning divides: Ten policy questions about the performance and equity of schools and schooling systems.* Montreal, Canada: UNESCO Institute of Statistics.

APPENDIX A

Summary of Trends in Female and Minority STEM Achievement and Attainment: K-12 through Post-secondary Schooling in Florida

I. Florida STEM Education PK-12

PK-12 Student Demographics

- Over 50% of students in Florida's public schools are minorities, primarily Hispanics (24%) and Blacks (23%).

K-12 Science Achievement by Race/Ethnicity

- The majority of Florida's students do not score at or above grade level (Level 3 and above) on FCAT-SSS Science. This finding is consistent for every grade level tested (5, 8 and 11).

- Performance on the FCAT-SSS Science declines across the grade levels (highest in 5th grade and lowest in 11th grade).

- Significant racial/ethnic disparities exist on FCAT-SSS Science and persist across all grade levels tested.
    - In 2007, Blacks (44% to 52%) and Hispanics (32% to 39%) had the highest percentage of students scoring at the lowest level; Whites had the smallest percentage (14% to 18%).
    - Conversely, White students had the highest percentage (49% to 56%) scoring at or above grade level (level 3 and above). Hispanics (27 to 32%) and Blacks (15% to 19%) had the lowest percentages.
    - The percentage of White students at or above grade level is almost twice as high as the percentage for Hispanic students and about triple the percentage for Black students in the same grades.

- Students of all races/ethnicities are showing progress in FCAT-SSS Science. However, the rate of progress varies in the lower grades (5 and 8). From 2005 to 2007, Black students had the greatest decrease in the percentage of students scoring at the lowest level (level 1), while White students had the greatest increase in the percentage of students scoring at higher levels (3 and above).

K-12 Math Achievement by Race/Ethnicity

- Overall, Florida's students perform better on FCAT-SSS Mathematics than Science. The relative superiority of math over science performance is substantial, particularly for Hispanics and Blacks.

- Despite the favorable comparison to Science, Mathematics performance remains low for many students.

- Significant racial/ethnic disparities exist on FCAT-SSS Mathematics in grades 5, 8 and 10.

- In 2007, Blacks (23% to 37%) and Hispanics (16% to 26%) had the highest percentage of students scoring at the lowest level; Whites had the smallest percentage (8% to 13%) – about half the percentage for Hispanics and one-third the percentage for Blacks.

- Conversely, White students had the highest percentage (69% to 77%) scoring at or above grade level (level 3 and above). Hispanics (51% to 63%) and Blacks (37% to 49%) had the lowest percentages.

- The percentage of White students at level 1 is about <u>half</u> the percentage for Hispanic students and about <u>one-third</u> the percentage for Black students in the same grades. Similar gaps between Whites and Blacks/Hispanics also exist in the percentage scoring 3 and above but are smaller in size.

- In Florida, students of all races/ethnicities are showing progress in FCAT-SSS Mathematics.
    - From 2005 to 2007, Blacks followed by Hispanics showed the greatest decrease in the percentage of students scoring at level 1 in middle and high school. Neither Whites, Blacks nor Hispanics showed much decline in the percentage of level 1 students in the upper elementary grades (grades 3-5).
    - Blacks followed by Hispanics also had the greatest increase in the percentage of students scoring at or above grade level (3 and above) – unlike science where Whites showed the greatest gain.

K-12 Math Achievement by Gender

- Male and female students in Florida show disparities in performance on the FCAT-SSS Mathematics, but the differences tend to be small in magnitude.

- Slightly more males than females score at level three and above; females have a slightly lower percentage of students scoring at the lowest level (Level 1).

- At the upper elementary and middle grades, females and males in Florida show similar gains in the percentage of students scoring at level 1 and at levels 3 and above. In high school, females continue to show progress, while males do not.

Advanced Placement Examination by Gender

- In 2006, Females accounted for the majority (59%) of Florida's 11th and 12th graders taking AP examinations.

- ❖ However, males took more exams per student and obtained higher scores on average than females.

Advanced Placement Examination by Race/Ethnicity

- ❖ In 2006, White, Hispanic and especially Asian students were overrepresented among Florida's 11th and 12th graders sitting for AP examinations, while Blacks were underrepresented.

- ❖ Whites, Hispanics and especially Asians took more examinations per student than Blacks. They also obtained higher scores (45 to 50% of examinations were scored 3 or higher – about twice the percentage as Black students (24%)).

II. Florida STEM Education Post-Secondary

SAT and ACT Scores by Race/Ethnicity

- ❖ Minorities comprise an increasing percentage of SAT and ACT test takers in Florida.

- ❖ A substantially higher percentage of minorities take the SAT and ACT in Florida, compared to the nation. In 2006, Blacks represented 21.4% of ACT test takers in Florida, compared to 12.9% in the nation. Hispanics comprised 17.3% of ACT test takers in Florida, compared to 8.0% in the nation.

- ❖ Florida Hispanics score above their national peers; Whites, Blacks and students of other races/ethnicities (i.e., Asians) score below their national peers.

SAT and ACT Scores and Course-taking

- ❖ Taking higher level courses in mathematics (e.g., calculus) and science (e.g., physics) is correlated with higher SAT and ACT scores.

- ❖ Course-taking is similar among males and females for lower level math courses, but a larger percentage of males take higher level math courses, such as calculus.

- ❖ Black test takers are less likely to take higher level math and science courses than Asians, Whites and Hispanics.

SAT and ACT Score Trends by Gender

- ❖ As in Florida's AP examinations, females comprise the majority (55%) of students taking the SAT. However, males consistently outscore females by 30 to 39 points in mathematics. A similar gender difference – smaller in size – exists on the ACT.

- The gender gap is evident for students of all races and ethnicities.

Florida's Community Colleges

- Two-thirds of Florida's community college students are enrolled in AA degree programs. 35% of AA degree enrollees are minorities. Of these, Hispanics are the largest minority (53%) followed by African Americans (37%), Asians (9%), and American Indians (1%).

- 36% of Florida's AS degree enrollees are minorities. Among AS enrollees and completers, African Americans are the largest minority.

- Females comprise a greater percentage of Florida's community college enrollees and completers than males in all racial/ethnic groups.

Under-represented Racial/Ethnic Groups in STEM Degree Attainment

- In Florida, White and Asian groups are overrepresented in state university degree attainment across all STEM fields, while Blacks and Hispanics are underrepresented (relative to their representation in the K-12 student population).

- Blacks are most underrepresented in mathematics, engineering, and engineering technology. Hispanics are most underrepresented in mathematics, physical sciences, and information technology.

Under-represented Gender Groups in STEM Degree Attainment

- In terms of STEM degree attainment at state universities in Florida, there has been a continual decline since 2000 in the number of both males and females completing degrees in information technology.

- Females are under-represented in the physical sciences, information technology, engineering, engineering technology, and mathematics, but are overrepresented in the life sciences.

- Females are making gains in the attainment of STEM degrees in engineering, engineering technology, and most notably, the physical sciences. However, a substantial gap still exists because males already overrepresented are also increasing their attainment of STEM degrees, although at a slower rate.

- Physical sciences is the STEM field in which females are making the greatest progress toward closing the gender gap. Although females are still underrepresented, degree attainment in the physical sciences is accelerating at a faster rate for females than males.

APPENDIX B
LITERATURE REVIEW

GENDER AND RACIAL ATTAINMENT DISPARITIES IN SCIENCE AND MATHEMATICS: A REVIEW OF THE LITERATURE

February 15, 2009

Faye R. Jones
W. Joshua Rew
Laura Hassler Lang

Female and Minority Initiative
Florida Center for Research in Science, Technology,
Engineering, and Mathematics (FCR-STEM)
Florida State University

Acknowledgements:

The authors wish to thank Christine Johnson, Hong Gao, Jian Gao, Danielle Sherdan, and the members of the Female and Minority Initiative Advisory Panel and Work Group for their helpful suggestions and insightful comments on previous drafts.

Corresponding Author:

Faye R. Jones
Female and Minority Initiative
FCR-STEM
Florida State University
C4600 University Center
Tallahassee, FL 32306
Email: fjones@admin.fsu.edu

GENDER AND RACIAL ATTAINMENT DISPARITIES IN SCIENCE AND MATHEMATICS: A REVIEW OF THE LITERATURE

Abstract

The authors review the literature with respect to the gender and racial attainment disparities in the fields of science and mathematics. Substantial disparities are evident in the science and mathematics attainment (opportunities, achievement, choices, and persistence) of female and minority students at the elementary, secondary, and post-secondary education levels. The authors identify the behavioral and social variables that explain the gender and racial attainment disparities. These variables include individual attributes (attitude, commitment, interest, self-concept, and self-efficacy), school features (school resources; teacher quality, distribution, and socialization practices; course-taking; instructional practices; and financial aid), and societal forces (socio-economic status, discrimination, and parental involvement and expectations). Their synthesis of the literature indicates that the evidence supporting the effectiveness of the majority of the variables is mixed and inconsistent, and only a few variables receive support from rigorous causal research. They conclude by identifying limitations in the literature and offering recommendations for future research.

Key Words: Females, minorities, science, mathematics, achievement, participation, persistence.

Introduction

Disparities in female and minority attainment in the fields of science and mathematics have profound economic and social implications. The disparities affect global economic competitiveness by weakening our nation's ability to meet the increasing demands for a labor force with skills, expertise, and literacy in science and mathematics. With females and minorities being underrepresented among those entering and remaining in science and mathematics fields (National Science Foundation, 2007), meeting the nation's workforce demands and, in turn, maintaining the global competitiveness of the U. S. economy will depend on solutions that reverse this trend (Gordon, 2007). An increasing demand for proficiency in science and mathematics, paired with a decreasing supply of females and minorities in those fields, suggests that females and minorities will have difficulty contending for employment and competitive wages in these fields (Neal & Johnson, 1996; Antecol & Bedard, 2004; Graham & Smith, 2005; Holzer, Offner, & Sorensen, 2005). Furthermore, attainment disparities exacerbate gender and racial income inequalities (Raudenbush & Kasim, 1998; Kerckhoff, Raudenbush, & Glennie, 2001; Finnie & Meng, 2002; De Anda & Hernandez, 2007) and, in turn, may even compromise individual psychological and physical health (Reynolds & Ross, 1998). Increasing the attainment of females and minorities in science and mathematics addresses national concerns related to the competitiveness of our labor force and economy, and the elimination of economic and social inequalities. Accordingly, it is imperative that policymakers, at the national, state, and local levels, fully comprehend the conditions that impact the plight of females and minorities in order to effectively address and ameliorate the disparities in science and mathematics.

The objective of our review is to summarize the findings from current literature that pertain to female and minority attainment disparities in the fields of science and mathematics.

We elect to pattern our review after the review by Oakes (1990) titled, "Opportunities, Achievement, and Choice: Women and Minority Students in Science and Mathematics." Despite its year of publication, the review by Oakes continues to be one of the most cited reviews of gender and minority attainment in the fields of science and mathematics. Additional narrative and meta-analytic reviews, such as those by Frost, Hyde, and Fennema (1994), Li (1999), Clewell and Campbell (2002), Ferguson (2003), Herzig (2004), Lee (2005), Jacobs (2005), Stinson (2006), and Wiggan (2007), also represent important works that contribute substantially to the literature. Rather than extensively covering the field, each of these reviews examined a specific phenomenon within the literature. However, we view Oakes' review as the appropriate model given its coverage and comprehensiveness.

We acknowledge that Oakes' review summarizes the literature conducted prior to 1990 on the attainment disparity by gender and race. Our review extends and builds upon her findings and valuable suggestions. Similar to Oakes' review, our review will address the following topics: female and minority opportunities, achievement, choice, and persistence in primary, secondary, and post-secondary schooling; the behavioral and social variables that explain the racial and gender disparity in science and mathematics; and suggestions for policy interventions and further research.

Literature Review Process

We began the literature review process by searching for existing reviews of literature and empirical studies that specifically discuss females and minorities in science and mathematics during the last 18 years. Our search for literature required the use of multiple search engines and databases, such as *Google Scholar*, *PsycINFO*, *ERIC*, *JSTOR*, and *ISI Web of Science*. We used several descriptors in our database search (female, minority, mathematics, science, achievement,

participation, and persistence). Following the database search, we searched for additional manuscripts in the volumes and issues of major journals, such as the *Review of Educational Research*, *Journal of Research in Science Teaching, American Educational Research Journal, Journal for Research in Mathematics Education, Science Education, Sociology of Education, Economics of Education Review,* and *International Journal of Science Education* among many others. Furthermore, we searched the reference lists of the manuscripts we found from either the databases or from the journals. Our search produced over 260 related manuscripts and reports from approximately 80 peer-reviewed journals and several research and governmental institutions, such as the National Science Foundation and the Institute of Education Science. The manuscripts used a variety of research methods (qualitative, correlational, quasi-experimental, and experimental) from various disciplinary perspectives (psychology, anthropology, sociology, and economics) to study the female and minority attainment disparity in mathematics and science.

Background

Oakes (1990) asserted that "three factors are critical to attainment: (a) opportunities to learn science and mathematics; (b) achievement in those subjects; and (c) the decision to pursue them" (p. 154). We add persistence as the fourth factor because of its salience at post-secondary education and occupational levels for females and minorities (Rayman & Brett, 1995; Fenske, Porter, & DuBrock, 2000). Therefore, we can attribute the female and minority attainment disparities within the fields of science and mathematics to differential opportunities, achievement, choice, and persistence at various levels of schooling including primary, secondary, and post-secondary (Oakes, 1990; Catsambis, 1994; Lee & Luykx, 2007).

Interestingly, Oakes (1990) stated that, coupled with encouragement, females and minorities respond to mathematics and science opportunities with competitive achievement and continued participation in those fields. Their response is equivalent to the response from White male students. The fact that females and minorities have similar responses when supportive conditions (encouragement and opportunity) are equivalent provides hope. It appears that the elimination of the attainment disparity rests upon, at a minimum, ensuring the provision of similar supportive conditions. However, the remedy is not that simple, as the literature suggests that female and minority students generally receive less encouragement (Browne & Rife, 1991; Lareau & Horvat, 1999; Yan & Lin, 2005) and have a smaller number of mathematics and science opportunities. Furthermore, minorities (including female minorities) attend racially segregated (Borman et al., 2004) and poor quality schools (Roscigno, 2000; Ainsworth, 2002), and possess inferior school resources (Duncombe & Yinger, 2005). Goldsmith (2004) added that Black and Hispanic students are more likely to come from low socio-economic and single parent households, and live in high poverty neighborhoods as compared to White students.

Ladson-Billings (1997) and Lee (2000) suggested that gender and racial disparities in mathematics and science are incredibly complex. Spelke (2005) stated that the disparities likely reflect the intersection of multiple and complex social, behavioral, and cultural variables and contexts. Thus, equalizing supportive conditions alone will not be sufficient; interventions will need to take into account the social, behavioral, and cultural contexts of the students, schools, curriculum, classrooms, and teachers (Ladson-Billings, 1995; Loving, 1998; Lee & Fradd, 1998). Oakes acknowledged the complexity, and stated, "our knowledge of the causes of low achievement and participation and our understanding of what policies and programs will improve them remains limited" (1990, p. 154). To resolve the lack of understanding, she suggested that

"we need considerable research to determine what programs will be the most successful" (p. 154).

Opportunities, Achievement, Choice, and Persistence

From the elementary to the post-secondary school level, prior mathematics and science achievement influences the opportunities, choices, and persistence of female and minority students (Oakes, 1990; House, 1993; Tate, 1997; Lucas & Berends, 2002). Particularly, prior achievement impacts the assignment of students to gifted programs in elementary school, pre-high school mathematics courses (i.e., pre-algebra, algebra, and geometry) in middle school, and academic curriculum tracks and college preparation courses in high school (Oakes, 1992). Schools typically assign low achieving students to low-ability and remedial courses, vocational and non-academic tracks (Braddock & Dawkins, 1993; Kao & Thompson, 2003), and to special education programs (Artiles & Trent, 1994; Harry & Anderson, 1994; Oswald, Coutinho, Best, & Singh, 1999; Eitle, 2002; Artiles, Harry, Reschly, & Chinn, 2002; Blanchett, 2006). This is especially the case for minority students; however, as schools do not necessarily assign females over males to specific courses or tracks. In most cases, females choose to enroll in courses or tracks according to their attitude, interest, and self-concept (Eccles, 2005; Jacobs, 2005). Nonetheless, without exposure to an advanced and high quality mathematics and science curriculum either through tracking or self-selection, female and minority students lose interest and participate less in mathematics and science opportunities. This has a negative impact on their opportunities, achievement, choices, and persistence.

Literature also cites specific examples of differential opportunities, choices, and persistence by race and gender. First, Black students participate at disproportionately lower levels in gifted education programs than White students (Ford, 1998), and participate more than

White students in special education programs, such as emotional/behavioral disability programs (Harry & Anderson, 1994; Patton, 1998; Coutinho & Oswald, 2000; Mandell, Davis, Bevans & Guevara, 2008). The greater participation of Black students in special education programs over White students is known as disproportionality, and is due to overidentification (Oswald, Coutinho, Best, & Singh, 1999). Second, Black and female students participate less in mathematics and science advanced placement (AP) programs than White and male students (Benbow, 1992; Stumpf & Stanley, 1998; Klopfenstein, 2004). Third, Black and female students persist less than White males in science and mathematics majors at the post-secondary level, such as chemistry, engineering, mathematics, and physics (Jacobs, 1996; Leslie, McClure, & Oaxaca, 1998; Simpson, 2001; Smyth & McArdle, 2004).

Lower levels of participation in gifted education and AP programs, and disproportionately higher levels of enrollment in emotional/behavioral disability programs can severely limit the opportunities, achievement, and choices of minority students. Less persistence in science and mathematics majors at the post-secondary level reduces the likelihood of occupational and income prestige (Simpson, 2001). It is important to note that disproportionality by gender does exist in terms of the placement of students in special education programs, such as emotional/behavioral and learning disability programs (Coutinho & Oswald, 2005). However, unlike minority students, male students represent a disproportionately greater number of students placed in special education programs than female students (Oswald, Best, Coutinho, & Nagle, 2003; Coutinho & Oswald, 2005; Oswald, Best, & Coutinho, 2006).

A substantial body of literature discusses the achievement gaps by race (Hanushek, 2001; Lubienski, 2002; Lee, 2002; Fryer & Levitt, 2006) and gender (Nowell & Hedges, 1998; Schreiber, 2002; Gonzales et al., 2004; Hyde & Linn, 2006). The large number of studies that

address gaps specifically in mathematics and science achievement examine nationally representative datasets, such as Project Talent, Equality of Educational Opportunity (EEO), the National Longitudinal Study of the High School Class of 1972 (NLS: 1972), the National Longitudinal Study of Youth (NLSY), High School and Beyond (HS&B), the National Educational Longitudinal Study of the Eight Grade Class of 1988 (NELS: 1988), the National Assessment of Educational Progress (NAEP), the Third International Mathematics and Science Study (TIMSS), and the Early Childhood Longitudinal Study Kindergarten Cohort (ECLS-K).

According to these studies, the differences in mathematics and science achievement between White and minority students extend from elementary to high school, and are relatively large. Analyzing the ECLS-K dataset, Fryer and Levitt (2004) discovered, from a sample of over 20,000 children, that Black and White children entering kindergarten have similar achievement according to a subjective teacher assessment of general knowledge and controlling for observable characteristics, such as age, birth weight, and socio-economic status. However, a .20 standard deviation gap in achievement emerged between Black and White children once they progressed to the first grade. They concluded that, if the trend continues, the achievement gap would increase to .50 of a standard deviation by the fifth grade. According to Tate (1997), White students exhibited higher mathematics achievement than Black and Hispanic students in elementary, middle, and high school as measured by the NAEP between 1973 and 1992, NELS: 1988, and the HS&B. However, substantial improvements in mathematics achievement for Black and Hispanic students during the 1980s and 1990s reduced, but did not eliminate, the mathematics achievement gap.

Hedges and Nowell (1999) confirmed Tate's findings after examining the same and additional datasets. They analyzed mathematics, reading, vocabulary, and science achievement

using the EEO, NLS: 1972, NLSY, HS&B, NELS: 1988, and the NAEP. They found that, for each dataset and at all grade levels, the mean achievement for White students exceeded that for Black students. Furthermore, the effect sizes (standardized mean difference *d*) ranged from medium to large even after an adjustment for socio-economic status, family, and community variables. Like Tate (1997), they observed a narrowing of the Black-White achievement gap in mathematics over time from $d = .75$ in 1960 to $d = .60$ in 1992. However, the science achievement gap increased from $d = .63$ in 1980 to $d = .76$ in 1992. Despite the decline in the mathematics achievement gap, the differences between White and Black students are still relatively large in both mathematics and science achievement. Based on their findings, Hedges and Nowell (1999) predicted that the mathematics and science achievement gaps would require more than 100 years to close according to the trends from the non-NAEP datasets and 75 years to close based on the NAEP dataset.

Mathematics and science achievement differences between male and female students are substantially smaller in magnitude compared to the differences between White and minority students. Hedges and Nowell (1995) and Nowell and Hedges (1998) analyzed the achievement differences by gender for several academic and vocational subjects including reading, vocabulary, mathematics, science, social studies, electronics, and auto and shop. Analyzing several nationally representative datasets, such as Project Talent, EEO, and NLS: 1972, NLSY, HS&B, and NELS: 1988, and the NAEP, they discovered that male students exhibited higher mathematics and science achievement than female students. The effect sizes for mathematics and science from non-NAEP and NAEP datasets are relatively small and appear to narrow over time. Tate's (1997) results support these findings based on analyses of the NAEP dataset between 1973 and 1992 and the NELS: 1988 dataset. Tate (1997) also found that the mathematics and

science differences between male and female students are very small at each grade level tested but noted that "mathematics achievement differences when they exist between genders emerge in secondary school" (p. 670). Hyde and Linn (2006) confirmed that gender differences do emerge in high school with males outperforming females on mathematics problem-solving ($d = .29$); however, there were no gender differences on mathematical computation and concepts. Recent evidence from state assessment data contradicts earlier research, and indicates that gender differences in mathematics are trivial in high school ($d < .10$) (Hyde et al., 2008). Furthermore, Hyde et al. (2008) suggested that gender differences on difficult mathematics items, such as mathematics problem-solving, are small and practically insignificant (average $d = .07$).

Behavioral and Social Variables

Oakes (1990) identified and grouped the most influential behavioral and social variables affecting the mathematics and science outcomes of females and minorities into three categories: individual attributes, schooling features, and societal forces. In most instances, studies find that the opportunities, achievement, choice, and persistence of either females or racial minorities depend on a combination of variables and not exclusively on a single variable (Volet, 1997; Singh, Granville, & Dika, 2002; Moore, 2006; Halpern et al., 2007). For instance, Hebert and Reis (1999) interviewed high-achieving students from diverse cultural backgrounds enrolled in an urban high school. They identified a range of variables that correlate with success, including motivation (individual attributes), challenging courses (schooling features), and parental and adult support (societal forces). The next three sections describe the findings of studies that focus on the influence of individual attributes, schooling features, and societal forces on the opportunities, achievement, choice, and persistence of females and minorities.

Individual Attributes

Individual attributes represent the affective, aptitude, and motivation of the student. They include cognitive and non-cognitive traits, such as ability, attitude, commitment, interest, self-concept of ability, and self-efficacy (Singh, Granville, & Dika, 2002; Alsop & Watts, 2003). Current literature finds that individual attributes influence the schooling outcomes of females and minorities (Andre, Whigham, Hendrickson, & Chambers, 1999; Bleeker & Jacobs, 2004; Bhanot & Jovanovic, 2005; Jacobs, 2005). For instance, Schreiber (2002) examined a sample of U.S. 12th grade students from TIMSS (N = 1,839), and noted that positive attitudes towards mathematics were positively correlated with advanced mathematics achievement. Schreiber's (2002) findings support evidence from Farenga and Joyce (1998), Utsumi and Mendes (2000), and Hammouri (2004). On the other hand, Ma (1997) suggested that attitude and achievement may have a reciprocal relationship. Furthermore, Ma and Xu (2004) and Georgiou, Stavrinides, and Kalavana (2007) contended that mathematics achievement is a stronger predictor of attitude than attitude is of mathematics achievement. However, in a review of five studies from Japan, Minato and Kamada (1996) discovered that attitude is a stronger predictor of achievement. Although the relationship between attitude and mathematics achievement remains unclear, attitude is an important individual attribute regardless of whether it is a predictor or an outcome of mathematics achievement.

Goal and institutional commitment are salient predictors of post-secondary and career persistence according to Leslie, McClure, and Oaxaca (1998), Leppel (2001), Davis et al. (2003), Mäkinen, Olkinuora, and Lonka (2004), and Strauss and Volkwein (2004). Goal commitment refers to the student's commitment to educational goals, while institutional commitment is the

student's commitment to her or his institution of higher education (Tinto, 1993). Grandy (1998) longitudinally studied the persistence of a sample of minority students in science and engineering careers (N = 2,557) and found that student institutional commitment was the strongest predictor of career persistence, more so than socio-economic status, prior achievement, or other predictors. Sandler (2000) had similar findings and noted that institutional commitment is a significant predictor of the persistence of a sample of adult and nontraditional undergraduate students (N = 469). However, Nora and Cabrera (1996) studied the persistence of a sample of college freshmen (N = 831) and found that goal and institutional commitment did not have a significant direct or indirect relationship with the persistence of minority students, while goal and institutional commitment had both a significant direct and indirect relationship with the persistence of non-minority students. Social integration, perceptions of prejudice, parental encouragement, and prior achievement were also found to be significant predictors of minority student persistence (Nora & Cabrera, 1996).

Interest and self-concept of ability, and their relationship with schooling outcomes, have received ample attention in the literature (Schiefele & Csikszentmihalyi, 1995; Greenfield, 1997; Marsh & Yeung, 1998; Jones, Howe, & Rua, 2000; Haussler & Hoffmann, 2002; Caleon & Subramaniam, 2007). For example, Jayaratne, Thomas, and Trautmann (2003) evaluated an intervention designed to improve the science persistence of a sample of eighth grade minority and non-minority females (N = 211). They found that non-minority females had greater interest in science and a greater self-concept of science ability than minority females. Linver and Davis-Kean (2005) studied a longitudinal sample of students (N = 1,651) from the Michigan Study of Adolescent Life Transitions (MSALT). They reported that higher interest and self-concept of math ability for honors female students correlated with a slower decline of math grades from the

seventh to the 12th grade, and had a greater influence for female students than male students. Awad (2007) examined the relationship between racial identity, self-concept of ability, self-esteem, and grade point average (GPA) and test scores for a sample of Black students (N = 313). Those findings indicated that self-concept of ability is a significant predictor of GPA but not of test scores. Thus, despite differences between minority and non-minority students, and low and high achieving students, it is apparent that interest and self-concept of ability have an important relationship with mathematics and science achievement (Ma & Kishor, 1997; Haussler & Hoffmann, 2002; Matson, DeLoach, & Pauly, 2004; Linver & Davis-Kean, 2005). Differences in the self-concept of ability and interest by race also predict differences in educational outcomes, such as participation and persistence (Jayaratne, Thomas, & Trautmann, 2003). However, similar to findings concerning attitude, the relationships between self-concept of ability and educational outcomes are reciprocal (Wang, Oliver, & Staver, 2008) with achievement (or other educational outcomes) as the stronger predictor (Hoge, Smit, & Crist, 1995).

Several studies examined the relationship between self-efficacy and mathematics and science outcomes (Pajares, 1996; Pajares & Graham, 1999; Bong, 2001; Nasser & Birenbaum, 2005; Stevens, Olivarez, & Hamman, 2006). Pajares and Miller (1994) compared the influence of self-efficacy and self-concept of ability on the mathematical problem solving of a sample of undergraduate students (N = 350). They noted that self-efficacy was a stronger predictor of problem-solving when compared to self-concept, and self-efficacy mediated the relationships of gender and prior experience with self-concept and mathematical problem-solving. Stevens et al. (2004) studied the relationship of self-efficacy and motivational orientation with the mathematics achievement and further participation in mathematics courses of a sample of ninth and 10th grade students (N = 358). They observed that self-efficacy is a significant predictor of mathematics

achievement as well as motivational orientation. Furthermore, they discovered a significant difference between Hispanic and White students in terms of the relationship between prior mathematics learning and self-efficacy. O'Brien, Martinez-Pons, and Kopala (1999) examined the relationships of gender, ethnicity, and mathematics self-efficacy with the career interests in mathematics and science of a sample of 11th grade students (N = 415). They indicated that gender and self-efficacy have a direct relationship with mathematics and science career interests. Interestingly, achievement, ethnicity, and socio-economic status are predictors of self-efficacy. Therefore, self-efficacy mediates the relationships of achievement, ethnicity, and socio-economic status with career interests in mathematics and science. Although the relationship between self-efficacy and achievement is not completely clear, the importance of self-efficacy as an individual attribute remains. In light of the vague relationship between individual attributes and educational outcomes (see Baumeister et al. (2003) concerning self-esteem), we put forward the possibility that attitude, self-concept of ability, and self-efficacy may act as mediators between prior and future educational outcomes. If these assertions were substantiated, they would not only clarify the promising role of individual attributes, but also provide an explanation of the importance of prior mathematics or science achievement as an antecedent predictor of future achievement.

School Features

School features have an intuitive relationship with mathematics and science opportunities, achievement, choice, and persistence. It is evident that certain school features, such as school resources and teacher quality, represent the foundation upon which all other school features rest. Female and minority students, and all students for that matter, would not have access to the spectrum of schooling opportunities without the foundational school features. Although the effectiveness of school resources is debatable (Greenwald, Hedges, & Laine, 1996;

Hanushek, 1997; Figlio, 1999), literature overwhelmingly acknowledges the critical importance of teacher quality (Goldhaber & Brewer, 2000; Rowan, Correnti, & Miller, 2002; Wayne & Youngs, 2003; Hill, Rowan, & Ball, 2005). We elect not to dedicate a discussion to school resources or teacher quality beyond the citations above due to the enormity of the literature, the ambiguous influence of school resources, and the relatively clear relationship between teacher quality and student educational outcomes. However, with respect to teacher quality, we will briefly discuss the distribution of effective teachers and teacher socialization practices with students, as well as course-taking, instructional practices, and financial aid.

While recent research points to the strong relationship between teacher quality and student outcomes (Rockoff, 2004; Rivkin, Hanushek, & Kain, 2005; Aaronson, Barrow, & Sander, 2007), the distribution of quality teachers is also of critical importance with respect to the racial science and mathematics attainment disparity. Recent findings from Clotfelter, Ladd, and Vigdor (2005) indicated that Black seventh grade students in North Carolina were more likely to have a novice mathematics teacher when compared to White students. They argued that the disproportionate assignment of Black students to novice teachers might not completely explain the Black-White achievement gap, but certainly had the potential to perpetuate it. Sanders and Horn (1998) noted in Tennessee that "black students were disproportionately assigned to the least effective teachers. Regardless of race, students who are assigned disproportionately to ineffective teachers will be severely academically handicapped relative to students with other teacher assignment patterns" (p. 254). However, Sanders and Horn (1998) indicated that Black students and White students had comparable levels of achievement when they had similar levels of prior achievement and quality teachers.

Teachers, as socializing agents, also have a strong relationship with the formation of science and mathematics interests and beliefs (Linver & Davis-Kean, 2005), achievement (Li, 1999), and the choices (Dick & Rallis, 1991) of females and minorities. Teachers socialize their students via expectations and beliefs, gender-stereotyping, and communication and feedback. According to Ferguson (2003), "racial biases can exist in teachers' perceptions, expectations, and behaviors, or in any combination of the three" (p. 493). Additionally, Tinto (1993) suggested that institutional and departmental cultures, an aggregated form of socialization, can work in favor or against student integration and involvement in post-secondary institutions. Many other studies have addressed expectations and beliefs (Jussim & Eccles, 1992; Eccles et al., 1993; She, 2000; Garrahy, 2001; Garrahy, 2003), gender-stereotyping (Tiedemann, 2000, Ferguson, 2003; Diamond, Randolph, & Spillane, 2004; Gray & Leith, 2004), and communication and feedback (She, 2000; Patrick et al., 2001). For instance, Linver and Davis-Kean (2005) examined several predictors of mathematics grades for a sample of male and female students (N = 1,651) using data from the MSALT. They noted that teacher expectations of students' abilities in seventh grade mathematics, along with prior achievement and parental expectations, are important predictors of the performance of high-ability seventh grade females. However, they also found that "males' grades did not depend on the expectations of their teachers, unlike for girls in the high-ability tracking group" (p. 59). Tiedemann (2000) reiterated these results, and also stated that teacher beliefs and expectations "for future achievement show a clear gender-stereotyped perceptual bias that could be more detrimental to girls' achievement than to boys" (p. 204). Furthermore, Tiedemann (2002) studied teacher gender-stereotyping and student mathematics achievement with a sample of elementary school students (N = 288), and reported that gender-

stereotyping by teachers distorts their impression of the mathematics achievement of students with prior low and average mathematics achievement.

The Institute of Education Science (2007) reviewed evidence from several studies concerning the teacher's role in modifying the self-concept of mathematics ability of female as well as minority students. Two experimental studies cited in the review found that communication in the form of praise from teachers to students (especially females and minorities), indicating that mathematics abilities can improve through effort and learning, assists students to gain confidence in their abilities (Mueller & Dweck, 1998; Blackwell, Trzesniewski, & Dweck, 2007). Moreover, Blackwell, Trzesniewski, and Dweck (2007) discovered that students in junior high school, including females and minorities, who indicate that they believe intelligence is incremental and malleable through effort and learning are more likely to "endorse stronger learning goals, hold more positive beliefs about effort, and make fewer ability-based, ''helpless'' attributions" (p. 258). Consequently, students with these beliefs "choose more positive, effort-based strategies in response to failure, boosting mathematics achievement over the junior high school transition" (p. 258). Both Mueller and Dweck (1998) and Blackwell, Trzesniewski, and Dweck (2007) affirmed that the key to mathematics achievement for both female and minority students is the communication from teachers that praise their efforts. However, Mueller and Dweck (1998) noted that praising the abilities of students instead of their efforts "could lead to even more detrimental achievement beliefs and behaviors" (p. 50) among female and minority students.

The Institute of Education Science (2007) also suggested that teachers should provide motivational support and feedback to students. The primary aim of motivational support and feedback is to enhance the beliefs of students concerning the reasons why they did or did not

exhibit high mathematics performance, and how to correct it (Turner et al., 2002; Schweinle, Turner, & Meyer, 2006). Turner et al. (2002) examined a sample of sixth grade elementary school students (N = 1,197), and noted that students "reported lower incidences of avoidance strategies in classrooms in which teachers provided instructional and motivational support for learning. In those classrooms, teachers helped students build understanding, gave them opportunities to demonstrate new competencies, and provided substantial motivational support for learning" (p. 102). Furthermore, these teachers "demonstrated that being unsure, learning from mistakes, and asking questions were natural and necessary parts of learning" (p. 102-103). Schweinle, Turner, and Meyer (2006) studied the motivation and affect of a sample of students in upper elementary mathematics classes (N = 6). While the sample size was small, the findings suggested that additional study was warranted regarding the provision of frequent, elaborative, positive, and helpful feedback related to the motivation and affect of male and female students in mathematics. Although the studies by Turner et al. (2002) and Schweinle, Turner, and Meyer (2006) used correlational and qualitative methods, their findings indicate that motivational support and feedback from teachers may enhance the motivation and affect of students with respect to mathematics achievement and persistence.

Substantial literature also examines the number and type of courses taken and their respective relationship with mathematics and science achievement (Farmer et al., 1995; Spade, Columba, & Vanfossen, 1997; Gutierrez, 2000; Ma and Wilkins, 2002). For instance, Lee, Croninger, and Smith (1997) studied a sample of high school students (N = 3,056) from the 1990 High School Transcript Study that is part of NAEP. Their correlational study indicated that students exhibited high math achievement in schools where they take more mathematics courses, where their mathematics courses fall within a college preparatory program, and where the

mathematics curriculum consists of higher proportions of academic courses. Davenport et al. (1998) analyzed the same dataset and compared the Carnegie units between gender and racial groups for a sample of 10,498 students. They noted that females earned less Carnegie units than males; however, the difference was extremely small and not significant. Females, on the other hand, earned more Carnegie units in the standard sequence of mathematics courses than males, but earned less Carnegie units in the advanced sequence of mathematics courses. With respect to racial groups, Asians and Whites significantly earned more Carnegie units than Blacks and Hispanics in the standard and advanced sequences of courses, and Black and Hispanic students earned more Carnegie units in the functional, preformal, and remedial mathematics courses. Finally, Trusty (2002) examined a nationally representative sample of recent college students (N = 2,956 females and 2,747 males) from NELS: 1988, and reported that female students, taking trigonometry, pre-calculus, or calculus in high school, were more likely to choose science and mathematics majors in college. Furthermore, compared to male students, the relationship between courses taken and college major was stronger in mathematics and weaker in science for females.

Several types of instructional practices, such as cooperative learning (Chang & Mao, 1999; Vaughan, 2002), small group instruction (Yackel, Cobb, & Wood, 1991), inquiry-based instruction (Kahle, & Damnjanovic, 1994), hands-on and laboratory inquiry (Lee & Burkham, 1996; Greenfield & Feldman, 1997), and project-based instruction (Barron et al.,1998), appear to have a relationship with the mathematics and science participation and achievement of females and minorities (Clewell & Campbell, 2002). However, the evidence is not entirely clear. For instance, Von Secker and Lissitz (1999) studied the relationship of instructional strategies emphasizing laboratory inquiry, critical thinking, and teacher-centered instruction with science

achievement using a sample of 10th grade students (N = 7,642) from the High School Effectiveness Study (HSES) of 1990. They noted that all three instructional practices either enlarged science achievement differences by race and gender or had a weak influence on the reduction of the race and gender gaps. Furthermore, Pine et al. (2006) used an experimental design to compare the effects of science hands-on inquiry with textbook curricula on four performance assessments given to a sample of fifth grade students (N = 1000). They indicated that no curricular effects or significant differences in the performance of male and female students due to either the hands-on inquiry or textbook curricula. Randler and Hulde (2007) also used an experimental design to study the effects of hands-on and teacher-centered experiments in soil ecology on a sample of fifth and sixth grade students (N = 123). However, dissimilar to Pine et al. (2006), they found that students participating in the hands-on experiment scored significantly higher than students that participated in the teacher-centered experiment. Also, female students exhibited superior achievement when compared to male students without a treatment by gender interaction. This indicates that both female and male students benefited from the hands-on experiment.

Finally, the Institute of Education Science (2007) also reviewed evidence from several experimental, quasi-experimental, and correlational studies concerning the instructional practices that improve the mathematics and science interest of students as well as improving their science and mathematics achievement and choices. Evidence indicated that teachers can improve the mathematics and science outcomes of male and female students by contextualizing and personalizing activities (Parker & Lepper, 1992; Cordova & Lepper, 1996; Renninger, Ewen & Lasher, 2002), using multimedia and technology-assisted instruction (Turner & Lapan, 2005;

Linn et al., 2006; Bottge et al., 2007), and using project-based learning (Schneider, Krajcik, Marx, & Soloway, 2002) and cooperative learning (Barron, 2000; Turner & Lapan, 2005).

Course-taking and instructional practices are school features that maintain relevance from elementary to post-secondary schooling; however, financial aid typically has direct application at the post-secondary level unless we refer to financial aid in the context of vouchers to attend private elementary and secondary schools or the provision of direct and indirect cash transfers to low SES families. Avery and Huxby (2004) studied the relationship between financial aid and college enrollment with a sample of high achieving high school students (N = 510) from various racial backgrounds. They noted that students choose institutions that offer larger grants, larger loans, and increased opportunities for work study employment. Additionally, Bettinger (2004) examined the relationship of gift aid or Pell Grants with the persistence of students in college and reported that rates of persistence correlated with the size of the Pell Grant. Finally, Hu (2008) discovered that, in one state university system, the decline in student enrollment in science and mathematics majors for five consecutive years correlated with the commencement of merit-aid programs. He also suggested that students may believe that science and mathematics courses are difficult and negatively impact GPA. Thus, they believe that difficult courses reduce their likelihood of competing for future merit aid. The findings by Avery and Huxby (2004), Bettinger (2004), and Hu (2008) demonstrate the important relationship financial aid has with the opportunities and persistence of racial minorities at the post-secondary level and in mathematics and science majors. Moreover, these findings also confirm evidence from Fenske et al. (2000), Kim (2004), St. John, Paulsen, and Carter (2005), Trent, Lee, and Owens-Nicholson (2006), and Chen and DesJardins (2008).

Societal Forces

Societal forces manifest themselves within the school as characteristics and behaviors of the institution, administration, teachers, parents, and students. They represent the social, economic, and political conditions that are typically outside the control and influence of the school, and include the following: the socio-economic status of the student's family, parental involvement and expectations, and discrimination. We will primarily address parent involvement and expectations in this section; however, we must call attention to the importance of familial socio-economic status and discrimination, and their relationship with the science and mathematics opportunities, achievement, choice, and persistence of female and minority students.

According to Buchmann (2002), socio-economic status consists of parental education, parental occupation, and family income. Yet, socio-economic status may also include additional family background measures, such as family structure (sibship size, birth order, and the number of parents in the home), social and cultural capital (social relationships and socially valued cultural practices, cues, and signals) and home resources (books, computers, and access to the internet) (Buchmann, 2002; Sirin, 2005). Several studies examined the relationship of familial socio-economic status with various cognitive and schooling outcomes including mathematics and science achievement (Secada, 1992; Pong, 1997; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Cameron & Heckman, 2001; Ermisch & Francesconi, 2001; Yang, 2003; Noble, Norman, & Farah, 2005). These studies, as well as earlier findings (Coleman et al., 1966), suggest that familial socio-economic status explains a disproportionate amount of variation in various schooling outcomes. With respect to discrimination, several studies examined its relationship, in forms including biased teachers and physical and verbal harassment, with participation and achievement among racial minorities (Sanders, 1997; Roscigno, 1999; English, 2002;

Rosenbloom & Way, 2004). It appears that discrimination exists and continues to influence the opportunities, achievement, choice, and persistence of minorities despite substantial efforts during the last 40 years to provide equal access to schooling opportunities for all students.

Parental involvement and expectations refer to the behaviors and practices of parents that may include parental confidence and aspirations, communication to children, participation in school activities, communication with teachers, and their education-related standards, requirements, and demands (Fan & Chen, 2001). A number of articles discussed the relationship of parental involvement and expectations with the educational outcomes of females (Bleeker & Jacobs, 2004; Bhanot & Jovanovic, 2005; Jacobs, 2005) and minorities (Smith & Hausafus, 1998; Jeynes, 2003). Jacobs, Chhin, and Bleeker (2006) analyzed a sample of students from 143 sixth grade classrooms using MSALT. They discovered that the parental gender-stereotyped occupational expectations for their children had a significant relationship with their children's later occupational expectations. Most notably, both the fathers' and mothers' gender-stereotyped occupational expectations for their daughters at age 17 significantly related to their daughters' actual gender-stereotyped occupations at age 28. Yan (1999) examined a sample of eighth grade students (N = 6,459) from the NELS: 1988 dataset, and reported that families of high achieving Black students had higher levels of parental involvement than families of low achieving Black students. Furthermore, families of high achieving Black students, despite having a comparative disadvantage due to income and family structure, demonstrated equal or higher levels of parental involvement when compared to families of high achieving White students.

Parental involvement and parental expectations, together with socio-economic status, represent parental privilege that passes from parent to child and has a very strong relationship with achievement (Jacobs & Harvey, 2005), choice (Dick & Rallis, 1991; David, Ball, Davies, &

Reay, 2003), and the acquisition of high status occupations (Andres & Grayson, 2003). However, Jeynes (2003) cautioned that, while parental involvement appears to be beneficial to minority students, the influence of parental involvement does not benefit all groups equally. That is, variables, such as the absence of cultural incentives and differences in family structures, moderate the relationship between parental involvement and educational outcomes for some minority groups more than others. For instance, Jeynes (2003) indicated that parental involvement has a greater influence on Black and Hispanic students over Asian students because "there are enough educational incentives present in other aspects of Asian American culture so that even without a large degree of parental involvement, students still do relatively well" (p. 215). Finally, Fan and Chen (2001) noted in their meta-analytic review of parental involvement and expectations that socio-economic status may act as a confounding variable in the context of the relationship between parental involvement and academic achievement. Therefore, it is necessary, according to Fan and Chen (2001), to partial out the influence of socio-economic status before forming claims concerning the importance of parental involvement and expectations.

Conclusion

The primary objective of our review is to discuss the current state of the gender and racial attainment disparity, and to identify the variables that relate to the opportunities, achievement, choice, and persistence of females and minorities in mathematics and science. From our review, we identified several critical variables and their relationship to females, minorities, and the fields of science and mathematics. There is some evidence to suggest that prior achievement, socio-economic status, and high quality teaching have a relationship with the educational outcomes across both gender and minority groups in science and mathematics at various levels of

schooling. Furthermore, we found evidence that the individual attributes of female and minority students (attitude, commitment, self-efficacy, interest, and self-concept), school features (teacher distribution and socialization, course-taking, instructional practices, and financial aid), and societal forces (parental involvement and expectations) have direct and indirect relationships with the attainment disparity.

Despite the relatively large number of variables listed above and the attractiveness of their implications as potential policy interventions, only a few represent policy interventions based on evidence from rigorous causal research. These policy interventions are school-based and relate to the instructional interaction between teachers and students. According to the literature, teachers should the praise student effort, contextualize instruction, and use of technology-assisted instruction, hands-on inquiry, project-based learning, and cooperative learning as part of classroom mathematics and science instruction. The literature also indicates that these interventions have a positive effect on a student's beliefs, learning goals, learning strategies, interest and motivation, achievement, and participation in mathematics and science courses. The remainder of the variables received mixed and insufficient support from the literature. For instance, we found a lack of clear evidence concerning the relationships of attitude, self-concept of ability, and self-efficacy with student educational outcomes. Additionally, we noted several inconsistencies across the literature with respect to the influence of some instructional practices and parental involvement and expectations on the opportunities, achievement, choice, and persistence of females and minorities in mathematics and science. It is apparent, not only from the review by Oakes (1990), but also from our review 18 years later, that significant gaps continue to exist in the literature. We recommend that policymakers, district leaders, and school leaders act cautiously when interpreting the potential impact of the variables.

Considering the strengths and weaknesses of the literature, we list several suggestions for further research.

First, the literature consists of a rich variety of research methodologies ranging from qualitative, correlational, and quasi-experimental and experimental designs. Unfortunately, the majority of the studies use qualitative and correlational designs. There is a paucity of causal studies that use experimental or quasi-experimental designs with well-matched, equivalent control and treatment groups. While other types of research designs may be helpful in developing promising interventions or providing preliminary findings, they have difficulty separating the effect of the treatment from the characteristics of the participants or rival explanations (National Research Council, 2002). Qualitative and correlational studies are subject to selection bias due to the failure to randomly assign participants to treatment and control groups (Schneider, Carnoy, Kilpatrick, Schmidt, & Shavelson, 2007). The Institute of Education Science (2003) noted that "this leads to erroneous conclusions about the effectiveness of the intervention" (p. 2). Acknowledging this limitation, we strongly encourage the use of more rigorous causal research in the form of randomized controlled experiments to inform policymakers and practitioners about the effectiveness of these interventions in districts, schools, and classrooms.

Second, there is also a paucity of studies that examine racial differences in terms of opportunities, achievement, choice, and persistence in science and mathematics. While small differences do exist between male and female students, the differences between Whites, Blacks, Hispanics, Asians, and other racial and ethnic groups are substantially larger and warrant an augmented share of the research. Therefore, we suggest that research place an increased emphasis on racial minorities. We support this assertion with recent evidence from Levin,

Belfield, Muennig, and Roouse (2007) that suggests that investing in the schooling of minorities, especially Black students, is an economic priority considering the high public returns.

Third, it is difficult to fully understand the influence of individual attributes, school features, and societal forces on the educational outcomes of minorities due to group aggregation. Group aggregation is particularly relevant for studies using large-scale, nationally representative datasets; however, it is applicable to any study. It is important to disaggregate or unpack racial and ethnic groups, such as Asians and Hispanics, in order to identify and understand the social, cultural, and behavioral phenomena that influence their educational outcomes. The aggregation of Asians and Hispanics is misleading when considering the variability within each racial and ethnic group (Gutierrez & Rogoff, 2003). For instance, group aggregation assumes that Hispanic and Asian students are homogeneous or that no dissimilarities exist between Cuban and Mexican American students, and between Japanese and Laotian American students. This represents a grave misconception that may lead to erroneous generalizations regarding each racial and ethnic group (see Ngo & Lee, 2007, concerning Southeast Asian American students as model minorities).

Fourth, our literature review is neither exhaustive nor comprehensive because the research concerning the improvement of opportunities, achievement, choices, and persistence of females and minorities in science and mathematics is multi-disciplinary, multi-level, and multi-methodological. Unfortunately, due to the extensive number of studies and reports from different disciplines, levels of schooling, and methodological backgrounds, we could not include all relevant and important topics, and many fell outside the scope of our literature review. For example, we encourage an evaluation of the quantity and effectiveness of interventions used in after-school programs for increasing female and minority achievement in mathematics and

science. We also encourage an examination of the role of formative assessment in schools for identifying the performance of underrepresented students in science and mathematics and improving instructional strategies simultaneously. Fifth and finally, we acknowledge that the relationships among females, minorities, and the fields of science and mathematics are extremely complex due to the intersection of social, behavioral, and cultural contexts. We believe that the elimination of gender and racial disparities in science and mathematics will require a multifaceted and multi-level approach that includes interventions at the individual, school, and societal levels, as well as the recognition and application of the complexity of the social, behavioral, and cultural contexts of females and minorities.

Considering the complexity of addressing female and minority attainment disparity, it is apparent that a single context cannot adequately address the disparities nor serve as the single antidote (Ladson-Billings, 1997). However, the emphasis on a single context is evident in the comparative overabundance of literature and theoretical models that lack the simultaneous inclusion of social, behavioral, and cultural contexts. For instance, Kahle, Parker, Rennie, and Riley (1993) and Eccles (2005) presented exceptional behavioral models of the relationship between gender, race, and educational outcomes in the fields of science and mathematics. Both studies, and their corresponding models, represent important contributions. Yet, each model lacks the social and cultural predictors of opportunities, achievement, choices, and persistence. Many studies favor the social and behavioral context while the cultural context of the student, teacher, and classroom are absent or ignored (Fuller & Clarke, 1994).

We do not view the omission of the cultural context as a conspiracy or hidden agenda. In all likelihood, it is a product of the dominance of disciplines, such as psychology, sociology, and economics over anthropology (Ladson-Billings, 2006). Nonetheless, we strongly encourage the

inclusion of the cultural context for several reasons beyond the apparent omission. This suggestion, however, may seem at odds with our previous call for an increase in research using randomized controlled experiments. The study of the cultural context requires a qualitative approach due to the nature of culture. Culture refers to the interpretation and application of meaning from artifacts or symbols. Levinson (2000) asserted that culture is the "use of symbols to understand and act upon the world" (p. 2). Levinson (2000) further stated that culture represents "the symbolic meanings expressed through language, dress, and other means, by which people in a society attempt to communicate with and understand themselves, each other, and the world around them" (p. 4). Ladson-Billings (1997) added that culture is "the deep structures of knowing, understanding, acting, and being in the world" (p. 700). Therefore, culture is merely the way an individual learns and applies knowledge.

The addition of the cultural context to rigorous causal research must involve the use of qualitative (and even correlational) research to conceptualize the phenomenon and make available the provisional results to design and implement randomized controlled experiments (Schneider, Carnoy, Kilpatrick, Schmidt, & Shavelson, 2007). The use of qualitative approaches, such as ethnographic and design studies, to studying the cultural context is also applicable when examining the processes and mechanisms of causality after determining the causal agent within a randomized controlled experiment (National Research Council, 2002). Therefore, qualitative approaches to studying the cultural context are critical as *a priori* and *post hoc* analyses. We view them as complimentary to randomized controlled experiments, and as significant components to the entire field that cannot be excluded or omitted.

Recent literature emphasizes the value of the cultural context and it's importance to the science and mathematics instruction for students from bilingual and non-English language

households (Ballenger, 1997; Lee & Fradd, 1998; Lee, 2002; Lee, 2005), teacher preparation (Haberman, 1991; Ladson-Billings, 1995; Cochran-Smith, 1995), and teacher professional development (Lee, Hart, Cuevas, & Enders, 2004; Lee, Deaktor, Enders, & Lambert, 2008). These studies present examples of culture as an additional lens to view students and teachers. We need to apply this lens for an alternative view of other facets of schooling, including school counselors and administrators, and their relationships with the opportunities, achievement, choices, and persistence of females and minorities. Finally, it is imperative that school personnel, especially teachers, become cross-culturally and multiculturally competent either through pre-service or in-service training programs. Competent teachers, whether labeled as cross-cultural or multicultural, have the affective, behavioral, and cognitive characteristics to effectively provide instruction to and understand the learning needs of diverse students (McAllister & Irvine, 2000). This is particularly critical to science and mathematics teachers that interact with students from diverse culturally, linguistically, and socio-economic backgrounds.

Cross-cultural and multicultural competency training also has serious implications related to teacher socialization practices (i.e., expectations and beliefs, gender stereotyping, and communication and feedback) and their relationship with the science and mathematics interests and beliefs, achievement, and choices of females and minorities. Although theoretically and conceptually appealing, the evidence from qualitative and correlational research is mixed (Lee, Luykx, Buxton, & Shaver, 2007). Therefore, we suggest, as we did previously, that rigorous causal research and complimentary approaches targeting minorities should receive increased emphasis so as to evaluate promising policy interventions, such as cross-cultural and multicultural competency training. Without systematic evidence, we must be cautious concerning any policy intervention because we have no way of discerning whether the effect is due to the

policy intervention, the characteristics of the participants (i.e., students and teachers), or a rival explanation. Bearing in mind the severity of the gender and racial attainment disparity in mathematics and science, we cannot afford ineffective policy interventions at the expense of scarce public resources, our economy, and, most importantly, female and minority students.

References

Aaronson, D., Barrow, L., & Sander, W. (2007). Teachers and student achievement in the Chicago public high schools. J*ournal of Labor Economics, 25*(1), 95-135.

Ainsworth, J. W. (2002). Why does it take a village? The mediation of neighborhood effects on educational achievement. *Social Forces, 81*(1), 117-152.

Alsop, S., & Watts, M. (2003). Science education and affect. *International Journal of Science Education, 25*(9), 1043-1047.

Andre, T., Whigham, M., Hendrickson, A., & Chambers, S. (1999). Competency beliefs, positive affect, and gender stereotypes of elementary students and their perceptions about science versus other school subjects. *Journal of Research in Science Teaching, 36*(6), 719-747.

Andres, L., & Grayson, J. P. (2003). Parents, educational attainment, jobs and satisfaction: What's the connection? A 10-year portrait of Canadian young women and men. *Journal of Youth Studies, 6*(2), 181-202.

Antecol, H., & Bedard, K. (2004). The racial wage gap. *Journal of Human Resources, 39*(2), 564-583.

Artiles, A. J., & Trent, S. C. (1994). Overrepresentation of minority students in special education: A continuing debate. *Journal of Special Education, 27*(4), 410-437.

Artiles, A. J., Harry, B., Reschly, D. J., & Chinn, P. C. (2002). Over-identification of students of color in special education: A critical overview. *Multicultural Perspectives, 4*(1), 3-10.

Avery, C., & Hoxby, C. M. (2004). Do and should financial aid packages affect students' college choices. In C. M. Hoxby (Ed.), *College choices: The economics of where to go, when to go, and how to pay for it*. Chicago: University of Chicago Press.

Awad, G. H. (2007). The role of racial identity, academic self-concept, and self-esteem in the prediction of academic outcomes for African American students. *Journal of Black Psychology, 33*(2), 188-207.

Ballenger, C. (1997). Social identities, moral narratives, scientific argumentation: Science talk in a bilingual classroom. *Language and Education, 11*(1), 1-14.

Barron, B., et al. (1998). Doing with understanding: Lessons from research on problem- and project-based learning. *The Journal of the Learning Sciences, 7*(3/4), 271-311.

Barron, B. (2000). Problem solving in video-based microworlds: Collaborative and individual outcomes of high-achieving sixth-grade students. *Journal of Educational Psychology, 92*(2), 391-398.

Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or health lifestyles? *Psychological Science in the Public Interest, 4*(1), 1-44.

Benbow, C. P. (1992). Academic achievement in mathematics and science of students between ages 13 and 23: Are there differences among students in the top one percent of mathematical ability. *Journal of Educational Psychology, 84*(1), 51-61.

Bettinger, E. (2004). How financial aid affects persistence. In C. M. Hoxby (Ed.), *College choices: The economics of where to go, when to go, and how to pay for it*. Chicago: University of Chicago Press.

Bhanot, R., & Jovanovic, J. (2005). Do parents' academic gender stereotypes influence whether they intrude on their children's homework? *Sex Roles, 52*(9/10), 597-607.

Blackwell, L., Trzesniewski, K., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development, 78*(1), 246-263.

Blanchett, W. J. (2006). Disproportionate representation of African American students in special education: Acknowledging the role of White privilege and racism. *Educational Researcher, 35*(6), 24-28.

Bleeker, M. M., & Jacobs, J. E. (2004). Achievement in math and science: Do mothers' beliefs matter 12 years later? *Journal of Educational Psychology, 96*(1), 97-109.

Bong, M. (2001). Role of self-efficacy and task-value in predicting college students' course performance and future enrollment intentions. *Contemporary Educational Psychology, 26*(4), 553-570.

Borman, K. M., et al. (2004). Accountability in a postdesegregation era: The continuing significance of racial segregation in Florida's schools. *American Educational Research Journal, 41*(3), 605-631.

Bottge, B. A., et al. (2007). Shrinking achievement differences with anchored math problems: Challenges and possibilities. *The Journal of Special Education, 41*(1), 31-49.

Braddock, J. H., & Dawkins, M. P. (1993). Ability grouping, aspirations, and attainments: Evidence from the national educational longitudinal study of 1988. *The Journal of Negro Education*, *62*(3), 324-336.

Browne, C. S., & Rife, J. C. (1991). Social, personality, and gender differences in at-risk and not-at-risk sixth-grade students. *The Journal of Early Adolescence, 11*(4), 482-495.

Buchmann, C. (2002). Measuring family background in international studies of education: Conceptual issues and methodological challenges. In A. C. Porter and A. Gamoran

(Eds.), *Methodological advances in cross-national surveys of educational achievement.* Washington D. C.: National Academy Press.

Caleon, I. S., & Subramaniam, R. (2007). Augmenting learning in an out-of-school context: The cognitive and affective impact of two cryogenics-based enrichment programmes on upper primary students. *Research in Science Education, 37*(3), 333-351.

Cameron, S. V., & Heckman, J. J. (2001). The dynamics of educational attainment for black, hispanic, and white males. *Journal of Political Economy, 109*(3), 455–499.

Catsambis, S. (1994). The path to math: Gender and racial-ethnic differences in mathematics participation from middle school to high school. *Sociology of Education, 67*(3), 199-215.

Chang, C., & Mao, S. (1999). The effects on students' cognitive achievement when using the cooperative learning method in earth science classrooms. *School Science and Mathematics,* 99(7), 374-379.

Chen, R., & DesJardins, S. L. (2008). Exploring the effects of financial aid on the gap in student dropout risks by income level. *Research in Higher Education, 49*(1), 1-18.

Clewell, B. C., & Campbell, P. B. (2002).Taking stock: Where we've been, where we are, where we're going. *Journal of Women and Minorities in Science and Engineering, 8*(3/4), 255-284.

Clotfelter, C. T, Ladd, H. F., & Vigdor, J. (2005). Who teaches whom? Race and the distribution of novice teachers. *Economics of Education Review, 24*(4), 377-392.

Cochran-Smith, M. (1995). Color blindness and basket making are not the answers: Confronting the dilemmas of race, culture, and language diversity in teacher education. *American Educational Research Journal, 32*(3), 493-522.

Coleman, J. S., et al. (1966). *Equality of educational opportunity.* Washington, D. C.: Government Printing Office.

Cordova, D., & Lepper, M. R. (1996). Intrinsic motivation and the process of learning: Beneficial effects of contextualization, personalization, and choice. *Journal of Educational Psychology, 88*(4), 715-730.

Coutinho, M. J., & Oswald, D. P. (2000). Disproportionate representation in special education: A synthesis and recommendations. *Journal of Child & Family Studies, 9*(2), 135-156.

Coutinho, M. J., & Oswald, D. P. (2005). State variation in gender disproportionality in special education: Findings and recommendations. *Remedial and Special Education, 26*(1), 7-15.

Davenport, E. C., Davison, M. L., Kuang, H., Ding, S., Kim, S., & Kwak, N. (1998). High school mathematics course-taking by gender and ethnicity. *American Educational*

Research Journal, 35(3), 497-514.

David, M. E., Ball, S. J., Davies, J., & Reay, D. (2003). Gender issues in parental involvement in student choices of higher education. *Gender and Education, 15*(1), 21-36.

Davis, L. E., Saunders, J., Johnson, S., Miller-Cribbs, J., Williams, T., & Wexler S. (2003). Predicting positive academic intention among African American males and females. *Journal of Applied Social Psychology, 33*(11), 2306-2326.

De Anda, R. M., & Hernandez, P. M. (2007). Literacy skills and earnings: Race and gender differences. *The Review of Black Political Economy, 34*(3-4), 231-243.

Diamond, J. B., Randolph, A., & Spillane, J. P. (2004). Teachers' expectations and sense of responsibility for student learning: The importance of race, class, and organizational habitus. *Anthropology & Education Quarterly, 35*(1), 75-98.

Dick, T. P. & Rallis, S. F. (1991). Factors and influences on high school students' career choices. *Journal for Research in Mathematics Education, 22*(4), 281-292.

Duncan, G. J., Yeung, W. J., Brooks-Gunn, J., & Smith, J. R. (1998). How much does childhood poverty affect the life chances of children? *American Sociological Review, 63*(3), 406-423.

Eccles, J. S., Midgley, C., Wigfield, A., Reuman, D., Mac Iver, D., & Feldlaufer, H. (1993). Negative effects of traditional middle-schools on students' motivation. *Elementary School Journal, 93*(5), 553- 574.

Eccles, J. S. (2005). Studying gender and ethnic differences in participation in math, physical science, and information technology. *New Directions for Child and Adolescent Development, 110*, 7-14.

Eitle, T. M. (2002). Special education or racial segregation: Understanding variation in the representation of black students in educable mentally handicapped programs. *The Sociological Quarterly, 43*(4), 575–605.

English, F. W. (2002). On the intractability of the achievement gap in urban schools and the discursive practice of continuing racial discrimination. *Education and Urban Society, 34*(3), 298-311.

Ermisch, J. F., & Francesconi, M. (2001). Family structure and children's achievements. *Journal of Population Economics, 14*(2), 249-270.

Duncombe, W., & Yinger, J. (2005). How much more does a disadvantaged student cost? *Economics of Education Review, 24*(5), 513-532.

Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-

analysis. *Educational Psychology Review, 13*(1), 1-22.

Farenga, S. J., & Joyce, B. A. (1998). Science-related attitudes and science course selection: A study of high-ability boys and girls. *Roeper Review, 20*(4) 247-251.

Farmer, H. S., Wardrop, J. L., Anderson, M. Z., & Risinger, R. (1995). Women's career choices: Focus on science, math, and technology careers. *Journal of Counseling Psychology, 42*(2), 155-170.

Fenske, R. H., Porter, J. D., & DuBrock, C. P. (2000). Tracking financial aid and persistence of women, minority, and needy students in science, engineering, and mathematics. *Research in Higher Education, 41*(1), 67-94.

Ferguson, R. F. (2003). Teachers' perceptions and expectations and the Black-White test score gap. *Urban Education, 38*(4), 460-507.

Figlio, D. N. (1999). Functional form and the estimated effects of school resources. *Economics of Education Review, 18*(2), 241-252.

Finnie, R., & Meng, R. (2002). Minorities, cognitive skills and incomes of Canadians. *Canadian Public Policy, 28*(2), 257-273.

Ford, D. Y. (1998). The underrepresentation of minority students in gifted education: Problems and promises in recruitment and retention. *Journal of Special Education, 32*(1), 4-14.

Frost, L., Hyde, J., & Fennema, E. (1994). Gender, mathematics performance, and mathematics-related attitudes and affect: A meta-analytic synthesis. *International Journal of Educational Research, 21*(4), 373-386.

Fryer, R. G. Jr., & Levitt, S. D. (2004). Understanding the Black-White test score gap in the first two years of school. *The Review of Economics and Statistics, 86*(2), 447-464.

Fryer, R. G. Jr., & Levitt, S. D. (2006). The Black-White test score gap through third grade. *American Law and Economics Review, 8*(2), 249-281.

Fuller, B., & Clarke, P. (1994). Raising school effects while ignoring culture? Local conditions and the influence of classroom tools, rules, and pedagogy. *Review of Educational Research, 64*(1), 119-157.

Garrahy, D. (2001). Three third-grade teachers' gender related beliefs and behavior. *The Elementary School Journal, 102*(1), 81-94.

Garrahy, D. (2003). Speaking louder than words: Teachers' gender beliefs and practices in third grade classrooms. *Equity & Excellence in Education, 36*(1), 96-104.

Georgiou, S. N., Stavrinides, P., & Kalavana, T. (2007). Is Victor better than Victoria at maths? *Educational Psychology in Practice, 23*(4), 329-342.

Goldhaber, D. D., & Brewer, D. J. (2000). Does teacher certification matter? High school teacher certification status and student achievement. *Educational Evaluation and Policy Analysis, 22*(2), 129-145.

Gonzales, P., Guzman, J. C., Partelow, L., Pahlke, E., Jocelyn, L., Kastberg, D., & Williams, T. (2004). *Highlights from the trends in international mathematics and science study (TIMSS) 2003*. Washington, DC: U.S. Government Printing Office.

Gordon, B. (2007). U.S. competitiveness: The education imperative. *Issues in Science and Technology, 23*(3), 31-36.

Graham, J. W., & Smith, S. A. (2005). Gender differences in employment and earnings in science and engineering in the US. *Economics of Education Review, 24*(3), 341-354.

Grandy, J. (1998). Persistence in science of high-ability minority students: Results of a longitudinal study. *The Journal of Higher Education, 69*(6), 589-620.

Gray C., & Leith, H. (2004). Perpetuating gender stereotypes in the classroom: A teacher perspective. *Educational Studies, 30*(1), 3-17.

Greenfield, T. A. (1997). Gender- and grade-level differences in science interest and participation. *Science Education, 81*(3), 259-276.

Greenfield, T. A., & Feldman, A. I. (1997). Improving science teaching for all students. *School Science and Mathematics, 97*(7), 377–386.

Greenwald, R., Hedges, L. V., & Laine, R. D. (1996). The effect of school resources on student achievement. *Review of Educational Research*, 66(3), 361-396.

Gutierrez, K. D., & Rogoff, B. (2003). Cultural ways of learning: Individual traits or repertoires of practice. *Educational Researcher, 32*(5), 19-25.

Gutierrez, R. (2000). Advancing African-American urban youth in mathematics: Unpacking the success of one math department. *American Journal of Education, 109*(1), 63-111.

Haberman, M. (1991). The pedagogy of poverty vs. good teaching. Phi Delta Kappan, 73, 290-294.

Haussler, P., & Hoffmann, L. (2002). An intervention study to enhance girls' interest, self-concept, and achievement in physics classes. *Journal of Research in Science Teaching, 39*(9), 870–888.

Halpern, D. F., Benbow, C. P., Geary, D. C., Gur, R. C., Hyde, J. S., & Gernsbacher, M. A. (2007). The science of sex differences in science and mathematics. *Psychological Science in the Public Interest, 8*(1), 1-51.

Hammouri, H. (2004). Attitudinal and motivational variables related to mathematics achievement in Jordan: Findings from the Third International Mathematics and Science Study (TIMSS). *Educational Research, 46*(3), 241-257.

Hanushek, E. A. (1997). Assessing the effects of school resources on student performance: An update. *Educational Evaluation and Policy Analysis*, *19*(2), 141-164.

Hanushek, E. A. (2001). Black-White achievement differences and government interventions. *American Economic Review, 91*(2), 24-28.

Harry, B., & Anderson, M. G. (1994). The disproportionate placement of African American males in special education programs: A critique of the process. *The Journal of Negro Education*, *63*(4), 602-619.

Haussler, P., & Hoffmann, L. (2002). An intervention study to enhance girls' interest, self-concept, and achievement in physics classes. *Journal of Research in Science Teaching, 39*(9), 870–888.

Hebert, T. P., & Reis, S. M. (1999). Culturally diverse high-achieving students in an urban high school. *Urban Education, 34*(4), 428-457.

Hedges, L. V., & Nowell, A. (1995). Sex differences in mental test scores, variability, and numbers of high scoring individuals. *Science*, *269*(5220), 41-45.

Hedges, L. V., & Nowell, A. (1999). Changes in the Black-White gap in achievement test scores. *Sociology of Education, 72*(2), 111-135.

Herzig, A. H. (2004). Becoming mathematicians: Women and students of color choosing and leaving doctoral mathematics. *Review of Educational Research, 74*(2), 171-214.

Hill, H. C., Rowan, B., & Ball, D. L. (2005). Effects of teachers' mathematical knowledge for teaching on student achievement. *American Educational Research Journal, 42*(2), 371-406.

Hoffer, T. B. (1992). Middle school ability grouping and student achievement in science and mathematics. *Educational Evaluation and Policy Analysis, 14*(3), 205-227.

Hoge, D. R., Smit, E. K., & Crist, J. T. (1995). Reciprocal effects of self-concept and academic achievement in sixth and seventh grade. *Journal of Youth and Adolescence, 24*(3), 295-314.

Holzer, H. J., Offner, P., & Sorensen, E. (2005). What explains the continuing decline in labor

force activity among young black men? *Labor History, 46*(1), 37-55.

House, J. D. (1993). Achievement-related expectancies, academic self-concept, and mathematics performance of academically underrepresented adolescent students. *Journal of Genetic Psychology, 154*(1), 61-71.

Hyde, J. S., & Linn, M. C. (2006). Gender similarities in mathematics and science. *Science, 314*(5799), 599-600.

Hyde, J. S., et al. (2008). Gender similarities characterize math performance. *Science, 321*(5888), 494-495.

Hu, S. (2008). *Merit-based financial aid and student pathways to the baccalaureate degree in science and engineering*. Paper presented at the annual forum of the Association for Institutional Research (AIR), May, Seattle, WA.

Institute of Education Science. (2003). *Identifying and implementing educational practices supported by rigorous evidence: A user friendly guide.* Washington D. C.: Institute of Education Science.

Institute of Education Sciences. (2007). *Encouraging girls in math and science: IES practice guide*. Washington D. C.: U. S. Department of Education.

Jacobs, J. A. (1996). Gender inequality and higher education. *Annual Review of Sociology, 22*, 153-185.

Jacobs, J. E. (2005). Twenty-five years of research on gender and ethnic differences in math and science career choices: What have we learned? *New Directions for Child and Adolescent Development, 110*, 85-94.

Jacobs, J. E., Chhin, C. S., & Bleeker, M. M. (2006). Enduring links: Parents' expectations and their young adult children's gender-typed occupational choices. *Educational Research and Evaluation, 12*(4), 395-407.

Jacobs, N., & Harvey, D, (2005). Do parents make a difference to children's academic achievement? Differences between parents of higher and lower achieving students. *Educational Studies, 31*(4), 431-448.

Jayaratne, T. E., Thomas, N. G., & Trautmann, M. (2003). Intervention program to keep girls in the science pipeline: Outcome differences by ethnic status. *Journal of Research in Science Teaching, 40*(4), 393-414.

Jeynes, W. H. (2003). A meta-analysis: The effects of parental involvement on minority children's academic achievement. *Education and Urban Society, 35*(2), 202-218.

Jones, M. G., Howe, A., & Rua, M. J. (2000). Gender differences in students' experiences,

interests, and attitudes toward science and scientists. *Science Education, 84*(2), 180–192.

Jussim, L., & Eccles, J. (1992). Teacher expectations II: Constructions and reflection of student achievement. *Journal of Personality and Social Psychology, 63*(6), 947-961.

Kahle, J. B., Parker, L. H., Rennie, L. J. & Riley, D. (1993). Gender differences in science education: Building a model. *Educational Psychologist, 28*(4), 379-404.

Kahle, J. B., & Damnjanovic, A. (1994). The effect of inquiry activities on elementary students' enjoyment, ease, and confidence in doing science: An analysis by sex and race. *Journal of Women and Minorities in Science and Engineering, 1*(1), 17-28.

Kao, G., & Thompson, J. S. (2003). Racial and ethnic stratification in educational achievement and attainment. *Annual Review of Sociology*, *29*, 417-442.

Kerckhoff, A. C., Raudenbush, S. W., & Glennie, E. (2001). Education, cognitive skill, and labor force outcomes. *Sociology of Education, 74*(1), 1-24.

Kim, D. (2004). The effect of financial aid on students' college choice: Differences by racial groups. *Research in Higher Education, 45*(1), 43-70.

Klopfenstein, K. (2004). Advanced Placement: do minorities have equal opportunity? *Economics of Education Review, 23*(2), 115-131.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal, 32*(3), 465-491.

Ladson-Billings, G. (1997). It doesn't add up: African American students' mathematics achievement. *Journal for Research in Mathematics Education, 28*(6), 697-708.

Ladson-Billings, G. (2006). It's not the culture of poverty, it's the poverty of culture: The problem with teacher education. *Anthropology & Education Quarterly, 37*(2), 104-109.

Lareau, A., & Horvat, E. M. (1999). Moments of social inclusion and exclusion: Race, class, and cultural capital in family-school relationships. *Sociology of Education, 72*(1), 37-53.

Lee, J. (2002). Racial and ethnic achievement gap trends: Reversing the progress towards equity. *Educational Researcher, 31*(1), 3-12.

Lee, O., & Luykx, A. (2007). Science education and student diversity: Race/ethnicity, language, culture, and socioeconomic status. In S. K. Abell & N. G. Lederman (Eds.), *Handbook of research in science education.* Mahwah, NJ: Lawrence Erlbaum Associates.

Lee, O., Luykx, A., Buxton, C., & Shaver, A. (2007). The challenge of altering elementary school teachers' beliefs and practices regarding linguistic and cultural diversity in science instruction. *Journal of Research in Science Teaching, 44*(9), 1269-1291.

Lee, O., Hart, J., Cuevas, P., & Enders, C. (2004). Professional development in inquiry-based science for elementary teachers of diverse students. *Journal of Research in Science Teaching, 41*(10), 1021-1043.

Lee, O. (2002). Promoting scientific inquiry with elementary students from diverse cultures and languages. *Review of Research in Education, 26*, 23-69.

Lee, O. (2005). Science education with English language learners: Synthesis and research agenda. *Review of Educational Research, 75*(4), 491-530.

Lee, O., & Fradd, S. H. (1998). Science for all: Including students from non-English language backgrounds. *Educational Researcher, 27*, 12-21.

Lee, O., Deaktor, R., Enders, C., & Lambert, J. (2008). Impact of a multiyear professional development intervention on science achievement of culturally and linguistically diverse elementary students. *Journal of Research in Science Teaching 45*(6), 726-747.

Lee, V. E., & Burkam, D. T. (1996). Gender differences in middle grade science achievement: Subject domain, ability level, and course emphasis. *Science Education, 80*(6), 613-650.

Lee, V. E., Croninger, R. G., & Smith, J. B. (1997). Course-taking, equity, and mathematics learning: Testing the constrained curriculum hypothesis in U.S. secondary schools. *Educational Evaluation and Policy Analysis, 19*(2), 99-121.

Leppel, K. (2001). The impact of major on college persistence among freshmen. *Higher Education, 41*(3), 327-342.

Leslie, L. L., McClure, G. T., & Oaxaca, R. L. (1998). Women and minorities in science and engineering: A life sequence analysis. *The Journal of Higher Education, 69*(3), 239-276.

Levin, H. M., Belfield, C., Muennig, P., & Rouse, C. (2007). The public returns to public educational investments in African-American males. *Economic of Education Review, 26*(6), 700-709.

Levinson, B. A. (2000). Introduction: Whither the symbolic animal? Society, culture, and education at the millennium. In B. A. Levinson et al. (Eds.), *Schooling the symbolic animal: Social and cultural dimensions of education*. Lanham, MD: Rowman and Littlefield.

Li, Q. (1999). Teachers' beliefs and gender differences in mathematics: a review. *Educational Research, 41*(1), 63-76.

Linn, M. C., Lee, H. S., Tinker, R., Husic, F., & Chiu, J. L. (2006). Teaching and assessing knowledge integration in science. *Science, 313*(5790), 1049-1050.

Linver. M. R., & Davis-Kean, P. E. (2005). The slippery slope: What predicts math grades in middle and high school? *New Directions for Child and Adolescent Development, 110*, 49-64.

Loving, C. C. (1998). Cortes' multicultural empowerment model and generative teaching and learning in science. *Science and Education, 7*(6), 533-552.

Lubienski, S. T. (2002). A closer look at Black-White mathematics gaps: Intersections of race and SES in NAEP achievement and instructional practices data. *Journal of Negro Education, 71*(4), 269-286.

Lucas, S. R., & Berends, M. (2002). Sociodemographic diversity, correlated achievement, and de facto tracking. *Sociology of Education, 75*(4), 328-348.

Ma, X. (1997). Reciprocal relationships between attitude toward mathematics and achievement in mathematics. *The Journal of Educational Research, 90*(4), 221-229.

Ma, X., & Kishor, N. (1997). Attitude towards self, social factors, and achievement in mathematics: A meta-analytic review. *Educational Psychology Review, 9*(2), 89-120.

Ma, X., & Wilkins, J. L. M. (2002). The development of science achievement in middle and high school. *Evaluation Review, 26*(4), 395-417.

Ma, X., & Xu, J. (2004). Determining the causal ordering between attitude toward mathematics and achievement in mathematics. *American Journal of Education, 110*(3), 256-280.

Mäkinen, J., Olkinuora, E., & Lonka, K. (2004). Students at risk: Students' general study orientations and abandoning/prolonging the course of studies. *Higher Education, 48*(2), 173-188.

Mandell, D. S., Davis, J. K., Bevans, K., & Guevara, J. P. (2008). Ethnic disparities in special education labeling among children with attention-deficit/hyperactivity disorder. *Journal of Emotional and Behavioral Disorders, 16*(1), 42-51.

Marsh, H. W., & Yeung, A. S. (1998). Longitudinal structural equation models of academic self-concept and achievement: Gender differences in the development of math and English constructs. *American Educational Research Journal, 35*(4), 705-738.

Matson, E., DeLoach, S., & Pauly, R. (2004). Building interest in math and science for rural and underserved elementary school children using robots. *Journal of STEM Education, 5*(3/4), 35-46.

McAllister, G., & and Irvine, J. J. (2000). Cross cultural competency and multicultural teacher education. *Review of Educational Research, 70*(1), 3-24.

Minato, S., & Kamada, T. (1996). Results of Research Studies on Causal Predominance between Achievement and Attitude in Junior High School Mathematics of Japan. *Journal for Research in Mathematics Education, 27*(1), 96-99.

Moore, J. L. (2006). A qualitative investigation of African American males' career trajectory in engineering: Implications for teachers, school counselors, and parents. *Teachers College Record, 108*(2), 246-266.

Mueller, C. M., & Dweck, C. S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology, 75*(1), 33-52.

Nasser, F., & Birenbaum, M. (2005). Modeling mathematics achievement of Jewish and Arab eighth graders in Israel: The effects of learner-related variables. *Educational Research and Evaluation, 11*(3), 277-302.

National Research Council. (2002). *Scientific research in education*. Washington D.C.: National Academy Press.

National Science Foundation. (2007). *Women, minorities and people with disabilities in science and engineering.* Arlington, VA: National Science Foundation.

Neal, D. A., & Johnson, W. R. (1996). The role of premarket factors in black-white wage differences. *The Journal of Political Economy, 104*(5), 869-895.

Ngo, B., & Lee, S. J. (2007). Complicating the image of model minority success: A review of Southeast Asian American education. *Review of Educational Research, 77*(4), 415-453.

Noble, K. G., Norman, M. F., & Farah, M. J. (2005). Neurocognitive correlates of socioeconomic status in kindergarten children. *Developmental Science, 8*(1), 74–87.

Nora, A., & Cabrera, A. F. (1996). The role of perceptions of prejudice and discrimination on the adjustment of minority students to college. *The Journal of Higher Education, 67*(2), 119-148.

Nowell, A., & Hedges, L. V. (1998). Trends in gender differences in academic achievement from 1960 to 1994: An analysis of differences in mean, variance, and extreme scores. *Sex Roles, 39*(1-2), 21-43.

Oakes, J. (1990). Opportunities, achievement, and choice: Women and minority students in science and mathematics. *Review of Research in Education, 16*, 153-222.

Oakes, J. (1992). Can tracking research inform practice? Technical, normative, and political considerations. *Educational Researcher, 21*(4), 12-21.

O'Brien, V., Martinez-Pons, M., & Kopala, M. (1999). Mathematics self-efficacy, ethnic identity, gender, and career interests related to mathematics and science. *Journal of Educational Research, 92*(4), 231-235

Oswald, D. P., Coutinho, M. J., Best, A. M., & Singh, N. N. (1999). Ethnic representation in special education: The influence of school-related economic and demographic variables. *The Journal of Special Education, 32*(4), 194-206.

Oswald, D. P., Best, A. M., Coutinho, M. J., & Nagle, H. A. L (2003). Trends in the special education identification rates of boys and girls: A call for research and change. *Exceptionality, 11*(4), 223-237.

Oswald, D. P., Best, A. M., & Coutinho, M. J. (2006). Individual, family, and school factors associated with the identification of female and male students for special education. *International Journal of Special Education, 21*(3), 120-137.

Pajares, F. & Miller, M. D. (1994). Role of self-efficacy and self-concept beliefs in mathematical problem solving: A path analysis. *Journal of Educational Psychology, 86*(2), 193-203.

Pajares, F. (1996). Self-efficacy beliefs and mathematical problem-solving of gifted students. *Contemporary Educational Psychology, 21*(4), 325-344.

Pajares, F., & Graham, L. (1999). Self-efficacy, motivation constructs, and mathematics performance of entering middle school students. *Contemporary Educational Psychology, 24*(2), 124-139

Parker, L., & Lepper, M. R. (1992). Effects of fantasy contexts on children's learning and motivation: Making learning more fun. *Journal of Personality and Social Psychology, 62*(4), 625-633.

Patrick, H., Anderman, L. H., Ryan, A. M., Edelin, K. C., & Midgley, C. (2001). Teachers' communication of goal orientations in four fifth-grade classrooms. *The Elementary School Journal, 102*(1), 35-58.

Patton, J. M. (1998). The disproportionate representation of African Americans in special education: Looking behind the curtain for understanding and solutions. *Journal of Special Education, 32*(1), 25-31.

Pine, J., et al. (2006). Fifth graders' science inquiry abilities: A comparative study of students in hands-on and textbook curricula. *Journal of Research in Science Teaching, 43*(5), 467-484.

Pong, S. (1997). Family structure, school context, and eighth-grade math and reading achievement. *Journal of Marriage and the Family, 59*(3), 734-746.

Randler, C., & Hulde, M. (2007). Hands-on versus teacher-centred experiments in soil ecology. *Research in Science &Technological Education, 25*(3), 329-338.

Raudenbush, S. W., & Kasim, R. M. (1998). Cognitive skill and economic inequality: Findings from the national adult literacy survey. *Harvard Educational Review, 68*(1), 1-28.

Rayman, P., & Brett, B. (1995). Women science majors: What makes a difference in persistence after graduation? *The Journal of Higher Education, 66*(4), 388-414.

Renninger, K. A., Ewen, L., & Lasher, A. (2002). Individual interest as context in expository text and mathematical word problems. *Learning and Instruction, 12*(4), 467-491.

Reynolds, J. R., & Ross, C. E. (1998). Social stratification and health: Education's benefit beyond economic status and social origins. *Social Problems, 45*(2), 221-247.

Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). Teachers, schools, and academic achievement. *Econometrica, 73*(2), 417-458.

Rockoff, J. E. (2004). The impact of individual teachers on student achievement: Evidence from panel data. *American Economic Review, 94*(2), 247-252.

Roscigno, V. J. (1999). The black-white achievement gap, family-school links, and the importance of place. *Sociological Inquiry, 69*(2), 159–186.

Roscigno, V. J. (2000). Family/school inequality and African-American/Hispanic achievement. *Social Problems, 47*(2), 266-290.

Rosenbloom, S. R., & Way, N. (2004). Experiences of discrimination among African American, Asian American, and Latino adolescents in an urban high school. *Youth & Society, 35*(4), 420-451.

Rowan, B., Correnti, R., & Miller, R. J. (2002). What large-scale, survey research tells us about teacher effects on student achievement: Insights from the *Prospects* study of elementary schools. *Teachers College Record, 104*(8), 1525-1567.

Sanders, M. G. (1997). Overcoming obstacles: Academic achievement as a response to racism and discrimination. *The Journal of Negro Education, 66*(1), 83-93.

Sanders, W. L., & Horn, S. P. (1998). Research findings from the Tennessee value-added assessment system (TVAAS) database: Implications for educational evaluation and research. *Journal of Personnel Evaluation in Education, 12*(3), 247-256.

Sandler, M. E. (2000). Career decision-making self-efficacy, perceived stress, and an integrated model of student persistence: A structural model of finances, attitudes, behavior and career development. *Research in Higher Education, 41*(5), 537-580.

Schiefele, U., & Csikszentmihalyi, M. (1995). Motivation and ability as factors in mathematics experience and achievement. *Journal for Research in Mathematics Education, 26*(2), 163-181.

Schneider, B., Carnoy, M., Kilpatrick, J., Schmidt, W. H., & Shavelson, R. J. (2007). *Estimating causal effects using experimental and observational designs*. Washington D.C.: American Educational Research Association.

Schneider, R. M., Krajcik, J., Marx, R. W., & Soloway, E. (2002). Performance of students in project-based science classrooms on a national measure of science achievement. *Journal of Research in Science Teaching, 39*(5), 410-422.

Schreiber, J. B. (2002). Institutional and student factors and their influence on advanced mathematics achievement. *The Journal of Educational Research, 95*(5), 274-286.

Schweinle, A., Turner, J. C., & Meyer, D. K. (2006). Striking the right balance: Students' motivation and affect in elementary mathematics. *The Journal of Educational Research, 99*(5), 271-290.

Secada, W. G. (1992). Race, ethnicity, social class, language, and achievement in mathematics. In D. A. Grouws (Ed.), *Handbook of research on mathematics teaching and learning*. New York: Macmillan.

She, H. (2000). The interplay of a biology teacher's beliefs, teaching practices and gender-based student-teacher classroom interaction. *Educational Research, 42*(1), 100-111.

Simpson, J. C. (2001). Segregated by subject: Racial differences in the factors influencing academic major between European Americans, Asian Americans, and African, Hispanic, and Native Americans. *The Journal of Higher Education, 72*(1), 63-100.

Singh, K., Granville, M., & Dika, S. (2002). Mathematics and science achievement: effects of motivation, interest, and academic engagement, *Journal of Educational Research, 95*(6), 323-332.

Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research, 75*(3), 417-453.

Smith, F. M., & Hausafus, C. O. (1998). Relationship of family support and ethnic minority students' achievement in science and mathematics. *Science Education, 82*(1), 111-125.

Smyth, F. L., & McArdle, J. J. (2004). Ethnic and gender differences in science graduation at selective colleges with implications for admission policy and college choice. *Research in Higher Education, 45*(4), 353-381.

Spade, J. Z., Columba, L., & Vanfossen, B. E. (1997). Tracking in mathematics and science: Courses and course-selection procedures. *Sociology of Education*, *70*(2), 108-127.

Spelke, E. S. (2005). Sex differences in intrinsic aptitude for mathematics and science? A critical review. *American Psychologist, 60*(9), 950-958.

Stevens, T., Olivarez, A., Lan, W. Y., & Tallent-Runnels, M. K. (2004). Role of mathematics self-efficacy and motivation in mathematics performance across ethnicity. *The Journal of Educational Research, 97*(4), 208-221.

Stevens, T., Olivarez, A., & Hamman, D. (2006). The role of cognition, motivation, and emotion in explaining the mathematics achievement gap between Hispanic and white students. *Hispanic Journal of Behavioral Sciences, 28*(2), 161-186.

St. John, E. P., Paulsen, M. B., & Carter, D. F. (2005). Diversity, college costs, and postsecondary opportunity: An examination of the financial nexus between college choice and persistence for African Americans and Whites. *The Journal of Higher Education, 76*(5), 545-569.

Stinson, D. W. (2006). African American male adolescents, schooling (and mathematics): Deficiency, rejection, and achievement. *Review of Educational Research, 76*(4), 477-506.

Strauss, L. C., & Volkwein, J. F. (2004). Predictors of student commitment at two-year and four-year institutions. *The Journal of Higher Education, 75*(2), 203-227.

Stumpf, H., & Stanley, J. C. (1996). Gender-related differences on the college board's advanced placement and achievement tests, 1982-1992. *Journal of Educational Psychology, 88*(2), 353-364.

Stumpf, H., & Stanley, J. C. (1998). Stability and change in gender-related differences on the college board advanced placement and achievement tests. *Current Directions in Psychological Science, 7*(6), 192-196.

Tate, W. F. (1997). Race-ethnicity, SES, gender, and language proficiency trends in mathematics achievement: An update. *Journal for Research in Mathematics Education, 28*(6), 652-679.

Tiedemann, J. (2000). Gender related beliefs of teachers in elementary school mathematics. *Educational Studies in Mathematics, 41*(2), 191-207.

Tiedemann, J. (2002). Teachers' gender stereotypes as determinants of teacher perceptions in elementary school mathematics. *Educational Studies in Mathematics, 50*(1), 49-62.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition.* Chicago: University of Chicago Press.

Trent, W. T., Lee, H. S., & Owens-Nicholson, D. (2006). Perceptions of financial aid among students of color. *American Behavioral Scientist, 49*(12), 1739-1759.

Trusty, J. (2002). Effects of high-school course taking and other variables on choice of science and mathematics college majors. *Journal of Counseling & Development, 80*(4), 464-474.

Turner, J. C., et al. (2002). The classroom environment and students' reports of avoidance strategies in mathematics: A multimethod study. *Journal of Educational Psychology, 94*(1), 88-106.

Turner, S. L., & Lapan, R. T. (2005). Evaluation of an intervention to increase non-traditional career interests and career-related self-efficacy among middle-school adolescents. *Journal of Vocational Behavior, 66*(3), 516-531.

Utsumi, M. C., & Mendes, C. R. (2000). Researching the attitudes towards mathematics in basic education. *Educational Psychology, 20*(2), 237-243.

Vaughan, X. (2002). Effects of cooperative learning on achievement and attitude among students of color. *The Journal of Educational Research, 95*(6), 359-364.

Volet, S. E. (1997). Cognitive and affective variables in academic learning: The significance of direction and effort in students' goals. *Learning and Instruction, 7*(3), 235-254.

Von Secker, C. E., & Lissitz, R. W. (1999). Estimating the impact of instructional practices on student achievement in science. *Journal of Research in Science Teaching, 36*(10), 1110-1126.

Waber, D. P., et al. (2007). The NIH MRI study of normal brain development: Performance of a population based sample of healthy children aged 6 to 18 years on a neuropsychological battery. *Journal of the International Neuropsychological Society, 13*(5), 729-746.

Walker, E. N. (2006). Urban high school students' academic communities and their effects on mathematics success. *American Educational Research Journal, 43*(1), 43-73.

Wang, J., Oliver, J. S., & Staver, J. R. (2008). Self-concept and science achievement: Investigating a reciprocal relation model across the gender classification in a crosscultural context. *Journal of Research in Science Teaching, 46*(6), 711-725.

Wayne, A. J., & Youngs, P. (2003). Teacher characteristics and student achievement gains: A review. *Review of Educational Research, 73*(1), 89-122.

Wiggan, G. (2007). Race, school achievement, and educational inequality: Toward a student-based inquiry perspective. *Review of Educational Research, 77*(3), 310-333.

Yackel, E., Cobb, P., & Wood, T. (1991). Small-group interactions as a source of learning opportunities in second-grade mathematics. *Journal for Research in Mathematics Education, 22*(5), 390-408.

Yan, W. (1999). Successful African American students: The role of parental involvement. *Journal of Negro Education, 68*(1), 5-22.

Yan, W., & Lin, Q. (2005). Parent involvement and mathematics achievement: Contrast across racial and ethnic groups. *The Journal of Educational Research, 99*(2), 116-127.

Yang, Y. (2003). Dimensions of socio-economic status and their relationship to mathematics and science achievement at individual and collective levels. *Scandinavian Journal of Educational Research, 47*(1), 21-41.

FCR-STEM Female-Minority Initiative APPENDIX C - Possible Measures for Evaluating the Success of the Plan		
POSSIBLE OUTCOME MEASURES for INTENDED IMPACTS		
IMPACT 1: STEM Learning and Achievement (Testing only)	**Level of Reporting**	**NOTES**
Increase in....among women and under-represented minorities		
Number and percent of students taking PSAT & PLAN for 9th through 11th Grades	State/district	PSAT (Math Only) and PLAN (Math & Science)
Number and percent of students passing PSAT & PLAN for 9th through 11th Grade	State/district	PSAT (Math Only) and PLAN (Math & Science) Define passing: What is the cutoff score?
Math SAT 10 scores (FCAT-NRT)	State/district	No Science SAT 10 (SAT 10 Is Ending in 2008)
Math and Science FCAT Scores	State/district	Math FCAT will be changed in 2011 to align with the new standards; Science FCAT in 2012.
Math and Science FCAT Scores and by Strand/Cluster	State/district	See above.
Number or percent of students passing end-of-course exams related to STEM	State/district	Math and Science
Number and percent of students taking Math and Science ACT & SAT tests	State/district	
Number and percent of students passing Math and Science ACT & SAT tests	State/district	
Math CLAST scores	State/district	
Number or percent of students participating in district/state STEM-related competitions	District	Science Fair, Mu Alpha Theta, First Robotics, SECME contests, Sunshine Math
IMPACT 2: STEM Choice	**Level of Reporting**	**NOTES**
Increase in....among women and under-represented minorities		
Percent of students declaring STEM-related majors in secondary school	State/district	
Percent of students declaring STEM-related majors in college	State/colleges & universities	As defined by the state
Percent of students declaring majors in STEM-support fields (e.g., Health) in college	State/colleges & universities	Must better define the relation and association, e.g., IT, Forensics, Nursing. Support is defined as STEM related or support
IMPACT 3: STEM Persistence and Completion	**Level of Reporting**	**NOTES**
Increase in...among women and under-represented minorities		
Number and percent of graduates (AS, BS, MS, and PhD) with degrees in STEM fields	State/colleges & universities	
Decrease in...among women and under-represented minorities		
Number and percent of attrition in STEM majors	State/colleges & universities	
Number or percent of attrition in STEM-support majors	State/colleges & universities	
IMPACT 4: Increase Female and Minorities in STEM	**Level of Reporting**	**NOTES**
Increase in...among women and under-represented minorities		
Proportional percent of graduates in STEM fields in College	State/colleges & universities	Example: If 20% of undergraduates are African American students and 10% are engineers, then 20% of the 10% should be African American
Proportional representation of high achieving students or students in top quartiles in math and science on FCAT	State/district	Comparable percentage among high achievers in middle/high schoo
Proportional percent of females and minorities working in STEM career	State	Would include academia, industry, and other related sectors of employmer

FCR-STEM Female-Minority Initiative APPENDIX C - Possible Measures for Evaluating the Success of the Plan		
POSSIBLE OUTCOME MEASURES for OUTPUTS		
OUTPUT 1: Increase Student Access/Opportunity in STEM	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Number of high schools offering calculus, physics, AP math and science, chemistry, etc	State	High School
Number of high schools offering science lab experiences	State	High School
OUTPUT 2: Increase Student Participation in STEM (i.e., math/sci course taking)	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Average number of math and science courses taken by students in secondary school	State/District	All math and science courses, regardless of level
Number and percent of students taking advanced math courses annually in high school	State/District	Define advanced as Honors, Advanced, Gifted, Among other IB, AP (3 or above)
Number and percent of students taking advanced science courses annually in high school	State/District	Define advanced as Honors, Advanced, Gifted, Among other IB, AP (3 or above)
Number and percent of students taking higher level math courses in secondary school	State/District	Higher Level is Beyond Alg 1 and Geometry (i.e., Algebra II) and beyond Biology
Number and percent of students taking higher level science courses in secondary school	State/District	Higher Level is Chemistry, Physics, and Other
Number and percent of students passing advanced math courses annually in high school	State/District	Passing is 'C' Or Above
Number and percent of students passing advanced science courses annually in high school	State/District	Passing is 'C' Or Above
Number and percent of students passing higher level math courses in secondary school	State/District	Passing is 'C' Or Above
Number and percent of students passing higher level science courses in secondary school	State/District	Passing is 'C' Or Above
STEM Grade Point Average (GPA)	State/District	At Elementary, Middle and High School Level
Number and percent of students taking Algebra I and Geometry in Middle School	State/District	
Number and percent of students taking and passing Algebra I on the first try	State/District	Middle and high school
Decrease in…by women and under-represented minorities		
Number and percent of HS graduates needing math and science remediation in college	State/District	An examination of the role of remediation in Community Colleges and HBCUs is needed
OUTPUT 3: Increase Student Career Awareness in STEM	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Ratio of students per career/guidance counselor	District	Student to counselor ratio recommended by the ASCA is 250 to 1
Number of school STEM-related career activities offered per year, aimed to increase female/minority participatior	School	emphasis on in-class engagement
Student knowledge of and interest in STEM careers	State	Through student surveys; if possible, add questions to an existing instrumer
OUTPUT 4: Increase Student Engagement in STEM (i.e.., math/sci outreach, programs, afterschool)	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Number and percent of students involved in STEM extracurricular activities (e.g., Science Olympiad, Future Cities, state science fair, university programs	School	requires business and community support - e.g., cover cost:
OUTPUT 5: Increase Individual Student Attributes (i.e., resilience, work ethic, good study habits, interest, attitude toward math/sci)	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Percent of students with more positive attitude towards math/science courses/activities	State/District	Interest measure (student survey)
Number and percent of students who failed Algebra I but passed on second tr	State/District	Resilience measure

FCR-STEM Female-Minority Initiative APPENDIX C - Possible Measures for Evaluating the Success of the Plan		
POSSIBLE OUTCOME MEASURES for OUTPUTS (continued)		
OUTPUT 6: Increase administrator and faculty math and science content and pedagogy	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Number of administrators/teachers successfully completing X or more hours of math/science professional development training	State	X hours to be defined (possibly 80 or more hours in a year) (training
Percent of students taught math/science courses by a teacher certified in field	State	Elementary, middle, high school (certificate)
Percent of students taught math/science by math/science specialists	State	Elementary, middle, high school (degrees in field))
OUTPUT 7: Increase cultural competence among administrators and faculty	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Percent of administrators and math/science teachers (middle, high, postsecondary) who are male/female	State/district/ colleges & universities	
Percent of administrators and math/science teachers by ethnicity	State/district/ colleges & universities	
Percent of districts with a cultural competency plan	State	Organizational values, commitment to provide culturally competent instruction, governance, planning, evaluation staff dev, organizational infrastructure, svcs/interventio
Percent of administrators/faculty completing X hours of cultural competency training over last three years	District	
Percent of students who feel that their administrators/teachers/faculty are culturally competent	State/district	Use student survey
OUTPUT 8: Increase academic and workforce alignment	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Number and percent of university STEM-degree graduates in a STEM-related job within a year of graduation	State/colleges and universities	Public Universities/Community Colleges only
Percent of HS and adult education students not pursuing college who obtain industry certification in STEM field	State/District	
Percent of community college students receiving a STEM-related or STEM-support bachelor's degree	State/community colleges	Community College BS Degrees
OUTPUT 9: Increase adult, family, and peer support for students	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Number and percent of activities for parents, such as family nights, that are STEM-related	School/District	minority and gender focus is priority; baseline data compared w/current - # and % increase
Number and percent of parents, adults, volunteers, and mentors with STEM experience	School/District	baseline data compared w/current - # and % increase
Number of STEM related afterschool programs	School/District	Includes traditional afterschool programs, YMCA, etc.
Number of parental workshops that provide parents for helping students with math/science	School/District	
Number of dollars supporting STEM-related activities (PTO funds, grants, etc	School/District	

FCR-STEM Female-Minority Initiative APPENDIX C - Possible Measures for Evaluating the Success of the Plan		
POSSIBLE OUTCOME MEASURES for OUTPUTS (continued)		
OUTPUT 10: Function of STEM Pipeline (or pipeline facilitation from K-20)	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Number and percent of students selecting STEM-related careers in high school who are admitted to STEM majors in college	District/University	Measure leakage; decrease/increase in interest (baseline data compared w/current school and labor market - # and % increase
Percent of undergraduate and graduate students pursuing STEM fields with financial assistance	University	
OUTPUT 11: Shift or establish resources to support STEM goals (i.e., state, district, and school levels)	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Dollar amount of line-item legislative appropriations supporting special initiatives/programs designed to increase participation and achievement in STEM field	State	baseline data compared w/current - # and % increase
Dollar amount of external grants that support STEM education (K-20)	State/districts/ colleges and universities	baseline data compared w/current - # and % increase
Dollar amount of industry contributions (cash and in-kind) to STEM education from K-2	State	baseline data compared w/current - # and % increase
OUTPUT 12: Establish or Increase accountability practices for women and minorities in STEM (K-20)	**Level of Reporting**	**NOTES**
Increase in…among women and under-represented minorities		
Percent of districts requiring STEM course and achievement data equity reporting	State	
Percent of colleges/universities requiring diversity impact statements from faculty in annual reports	State	

APPENDIX D

FCR-STEM Female and Minority Initiative
Work Group Members

Julie Alexander
Director of Educational Services and Articulation
Division of Community Colleges
Florida Department of Education

Angela Birkes
Research Specialist
Research and Evaluation Department
DeKalb County Schools (Georgia)

Susan Blessing
Director of Women in Mathematics, Science and Engineering (WIMSE) and
Professor of Physics
Florida State University

Susan Borland[1]*
Education Manager
Challenger Learning Center of Tallahassee

Consuelo Boronat*
Director, Title V
Florida International University

Beverly Bower
Associate Professor of Higher Education
Florida State University

Tommy Chambers
President
Aim2Win Solutions, LLC

Paula Cifuentes
Faculty Coordinator of Math & Science
Lake City Community College

Todd Clark*
Deputy Director
Office of Mathematics and Science
Florida Department of Education

Leah Cook*
Program Director
Girls Get IT

Mary Jane Dann
Principal
Douglas L. Jamerson, Jr. Elementary School

Jimmie Lee Davis, Jr.*
Senior Software System Engineer
MITRE Corporation

Anne Donnelly
Director
South East Alliance for Graduate Education and the Professoriate
University of Florida

Christina Drake*
Research Engineer
Lockheed Martin Missiles and Fire Control

Patrick Enderle
Research Assistant and Doctoral Student in Science Education
Florida State University

Adeola Fayemi
Director
Office of Equity & Access
Florida Department of Education

Yvonne Fonnett
Educator
Dr. Phillips High School
Orange County Public Schools

Penelope Haskins
President and CEO
Radiation Technologies, Inc.

Monica Hayes*
Regional Director
National Math and Science Initiative

Jacqueline Hightower
Coordinator of Academic Affairs and Advisor to the Environmental Sciences Student Organization (ESSO)
Florida A&M University

---

[1] *** Also served on the Advisory Board**

APPENDIX D

FCR-STEM Female and Minority Initiative Work Group Members

Shouping Hu*
Associate Professor of Higher Education
Department of Educational Leadership and Policy Studies
Florida State University

Gladis Kersaint
Associate Professor of Mathematics Education
University of South Florida

Charlene Kincaid
Coordinator of Mathematics (K-12)
Santa Rosa County School Board.

Kathy Leroy
Chief Officer of Math & Science
Duval County Public Schools

Karen Martinoff
President and CEO
Hayes e-Government Resources, Inc.

Lisa McClelland
Doctoral Student in Higher Education
Florida State University and
Former Director of the McNair Program
Florida A&M University

Mike McKee
Director
GO-GK-12
University of Central Florida

Kimberly Moore
Chief Executive Officer
WORKFORCE plus

Louise Muscarella-Daxon
Test/Chair
Miami-Edison Senior High School
Miami-Dade County Public Schools

Jeffery Murfree
Director of Prek-12 STEM Educator Professional Development
Teacher Resource Network/The Teacher Channel

Nirmala Ramlakhan
Education Project Manager
Workforce Central Florida

Ava Rosales
Instructional Supervisor, Curriculum and Instruction (Science)
Miami-Dade County Public Schools (M-DCPS)

Walter Secada
Professor, Curriculum & Instruction,
University of Miami

Jacqueline Smith
Director, Minority Engineering & Computing Science Center for Academic Advancement
University of Central Florida

Berrin Tansel
Associate Director, Center for Diversity in Engineering and Computing and
Associate Professor, Civil and Environmental Engineering.
Florida International University

Sylvia Wilson Thomas
Assistant Dean
College of Engineering
University of South Florida

Sharisse Turnbull
Graduate Assistant in Instructional Systems Design
Florida State University

APPENDIX D

FCR-STEM Female and Minority Initiative Work Group Members

Biographies

Julie Alexander is the Director of Educational Services and Articulation for the Florida Department of Education's Division of Community Colleges. Her primary responsibilities include admissions-related issues, articulation, dual enrollment, residency, bill analysis and policy recommendation and interpretation. Ms. Alexander has previously served as Bureau Chief of Special Projects in the Division of Workforce Education; Policy Analyst in Planning and Institutional Research at the Florida Board of Governors; Assistant Administrator of the Statewide Course Numbering System, and as an art teacher in Texas and Botswana, Africa. Ms. Alexander holds a Master's degree in Education in Instructional Technology from the University of West Florida and a Bachelor's degree in Fine Arts in Art Education from University of North Texas.

Angela Birkes is a Research Specialist for the Research and Evaluation Department of Georgia's DeKalb County School System, where she serves on the Research Review Committee and makes recommendations on research proposals. She formerly was a Senior Research Associate for the P-16 Data and Analysis Systems Division where she was the project manager for the Middle School Achievement and Interest in Mathematics and Science (MS-AIMS) initiative and a member of the Data and Analysis Systems team supporting the P-16 Data Mart project. Dr. Birkes also has served as the Associate Director of the Southern Regional Education Board's Adult Learning Campaign established to encourage adults to consider postsecondary education. She also has provided consulting/project management services for SECME Inc. and the Georgia Space Grant Consortium at the Georgia Institute of Technology's College of Engineering, where she has been research faculty. Dr. Birkes earned her mechanical engineering degree at Howard University and both master's and doctoral degrees in civil engineering from the Georgia Institute of Technology.

Susan Borland is the Education Manager of the Challenger Learning Center of Tallahassee, where she engages students, especially females and minorities, in STEM subjects through space science and simulation. She has developed STEM-oriented curricula and provided STEM programming for Title I and 21st Century grant-funded schools in Leon County. Ms. Borland has a wide range of experience providing in-service training to teachers through Challenger Pre-Mission workshops, Aerospace education workshops, NASA CONNECT and Careers in Engineering, among others. Ms. Borland received the 2007 Kid's Incorporated Children's Champion award primarily for her work with underserved populations. She is certified to teach health, middle school science, biology, and earth science.

Tommy L. Chambers is the President of Aim2Win Solutions, LLC, a small professional services company that provides management and technology consulting, professional and personal development services, and professional speaking services. He is also Program Director of the Student Information System at Jobs for the Future in Boston, Massachusetts. Before starting Aim2Win Solutions, Mr. Chambers served as the Director of the Early College High School Initiative at SECME, Inc. at the Georgia Institute of Technology. He has extensive software engineering, technology, and technical management experience, including lead software engineer and flight controller at NASA's Jet Propulsion Laboratory, software engineer and software engineering manager at Skytel/MCI, computer programmer at the U.S. Geological Survey, and President of Intelogix Corporation, a software company in Acworth Georgia.

APPENDIX D

FCR-STEM Female and Minority Initiative Work Group Members

Mary Jane Dann is Principal of Douglas L. Jamerson, Jr. Elementary School, a diverse inner city public school in St. Petersburg, Florida which has earned the Magnet Schools of America "Magnet School of Excellence" award for the last two years. The focus on engineering and mathematics in an elementary school gives students real world opportunities to think and analyze critically and quantitatively. Students engage in high-level learning experiences in engineering using the Jamerson Design Process, where students define problems and then research, design, construct, test, analyze, and communicate solutions. The staff, with University of South Florida Engineering direction, has created its own integrated engineering curriculum that is standards based and focuses on basic engineering concepts as well as provides awareness of nontraditional STEM career professions.

Jimmie Lee Davis, Jr. is a Senior Software System Engineer for the MITRE Corporation and serves on the Space Florida Board of Directors. Established to create new technology for the Department of Defense, MITRE currently manages research and development centers for the Department of Defense, the Federal Aviation Administration and the Internal Revenue Service. Dr. Davis has an impressive record of leadership in the minority technology and science community. He has worked with organizations that reach out to young people, including the Harriet G. Jenkins Predoctoral Fellowship Program Review Committee and the J.C. & Frankie Watts Foundation Inaugural Full Impact Leadership Academy. As an undergraduate at Morehouse College, he founded a successful outreach program with the National Society of Black Engineers. Dr. Davis holds doctorate and master's degrees in Electrical Engineering from the University of Massachusetts Lowell.

Anne Donnelly is the Director of the South East Alliance for Graduate Education and the Professoriate at the University of Florida, one of a national network of National Science Foundation (NSF) Projects designed to increase the diversity of the nation's faculty in science, engineering, and mathematics. She has served in this capacity for the past 10 years, during which time 22 science, engineering, and mathematics (SEM) departments have graduated 23 Ph. D. recipients and 7 Master's degree recipients. Dr. Donnelly also serves as the Associate Director of Education for the Particle Engineering Research Center, a graduated NSF ERC, that offered research experiences to over 700 undergraduate students over 10 years. This program consistently outperformed national averages for inclusion of women and minorities.

Christina Drake is a Research Engineer for Lockheed Martin Missiles and Fire Control where she is a member of the Sensor Technology and Materials group. Dr. Drake holds a Ph.D. in Materials Science and Engineering from the University of Central Florida and a B.S., cum laude, in Materials Science and Engineering from the University of Florida where she worked as a mentor, tutor, and camp counselor with the Step-UP program. Based at the UF College of Engineering, the Step-UP program aims to increase minority and female retention in the engineering disciplines, through middle and high school summer camps, and mentoring and tutoring for freshman and sophomore engineering students. At UCF, she was a National Science Foundation GK-12 Fellow helping low-performing public schools transform science instruction for students who have traditionally underperformed in that subject area. Her continuing teaching interests involve working with minority and female students in the sciences.

APPENDIX D

FCR-STEM Female and Minority Initiative Work Group Members

Patrick Enderle is a Research Assistant and Doctoral Student in Science Education at Florida State University, where he is involved in a five-year NSF project aimed at understanding the effectiveness of different professional development approaches related to inquiry teaching practices. His other research interests include reforming undergraduate science education and evolution and Nature of Science education. Mr. Enderle is originally from North Carolina, where he earned a Bachelor's and Master's degree in Molecular Biology from East Carolina University. His teaching experience includes high school, community college, and large undergraduate courses in different aspects of biology. In Florida, Patrick has assisted in developing the new Sunshine State Standards in science and has offered professional development experiences related to evolution education.

Jacqueline Hightower is a Coordinator of Academic Affairs and Advisor to the Environmental Sciences Student Organization (ESSO) in the Academic Affairs – Office of Accreditation Reaffirmation at Florida A&M University (FAMU), where she is a student advocate and champion of environmental sustainability. After working for ten years as a Technology Analyst in the corporate sector, she was awarded a one year sabbatical to teach Information Systems courses at FAMU. Upon completing her graduate degree, she joined the Environmental Sciences Institute (ESI) , where she secured grant funds and in-kind donations to support ESSO initiatives including a science poster competition for local elementary schools. Ms. Hightower was selected FAMU's "*Advisor of the Year*" after one year in her current position. Over the last 14 months she co-chaired the planning committee that brought *Focus the Nation Teach-In on Global Warming Solutions for America* to FAMU.

Monica Hayes, is the former Regional Director with the National Math and Science Initiative. She is also the former Director of the K-20 Office of Equity, Global and International Education in the Florida Department of Education, where she managed Florida's $7.125 million dollar partnership contract with the College Board, and the former statewide Director for Florida's College Reach-Out Program (CROP), a legislatively funded program ($3.92M) designed to reach at risk minority and underrepresented students. Ms. Hayes is an accomplished public speaker on a range of topics related to education, closing the achievement gap, and cultural competency. She believes that the primary mission of educational institutions should include modeling cultural competency, closing the achievement gap for minority and underrepresented students, and setting high expectations that enable all students to become well-rounded and fully functioning members of our communities.

Shouping Hu is an Associate Professor of Higher Education in the Department of Educational Leadership and Policy Studies at Florida State University. He received an M.A. degree in economics and a Ph.D. in higher education from Indiana University. Dr. Hu's primary research interest is to identify factors influence student postsecondary decisions, including the choice of and persistence in the STEM fields.

Charlene Kincaid is the Coordinator of Mathematics (K-12) for the Santa Rosa County School Board. Over the years, Ms. Kincaid has received numerous recognitions and awards as a mathematics educator. She earned the Presidential Award for Excellence in Mathematics and Science Education (secondary mathematics) as a state and national awardee. She was named a Tandy Technology Scholar Teacher by RadioShack, an Associate Master Teacher for the State of Florida, and an Honors Master Teacher for NEWMAST (NASA and NCTM sponsored

APPENDIX D

FCR-STEM Female and Minority Initiative Work Group Members

Mathematics and Science Teacher Education Workshops). She has served on the Florida Department of Education's Standards Writing Team for both the 1996 and 2007 mathematics standards; the Region I Planning Team for the Statewide Systemic Initiative in Mathematics; the Office of Mathematics and Science Advisory Committee; and the Florida Comprehensive Assessment Test Content Advisory Committee. Ms. Kincaid was a co-teacher, facilitator, and curriculum developer of the Flight Adventure Deck project, a hands-on mathematics and science program for middle school students designed by a partnership of Santa Rosa and Escambia County Schools and the National Naval Aviation Museum.

Karen Martinoff is President and CEO of Hayes e-Government Resources, Inc. headquartered in Tallahassee, Florida. As an entrepreneur, she has built Hayes from a small company into one of the leading woman-owned minority technology businesses in Florida. Hayes e-Government Resources, Inc has provided information technology services and solutions to State of Florida government agencies, local governments, school districts and commercial businesses. Currently, Hayes is the prime contractor for the Florida Department of Education's Florida Information Resource Network (FIRN2) serving over two million users in K-12 schools throughout the state of Florida. As prime contractor, Hayes engineered the combined resources and industry expertise of major communication providers AT&T, Embarq and Verizon to serve Florida's education community.

Lisa McClelland is a doctoral student in higher education at Florida State University, where her research interests include disparities in the representation of minorities and females in STEM fields. Ms. McClelland has worked in higher education for over sixteen years. During the last ten, she served as Director and Assistant Professor of the Ronald E. McNair Postbaccalaureate Achievement program at Florida A&M University. The McNair program is designed to increase the attainment of Ph.D. degrees by students from underrepresented segments of society by involving low-income, first-generation undergraduate students in research and other scholarly activities.

Kimberly Moore has spent nearly a decade in the workforce development arena. She currently serves as the Chief Executive Officer of WORKFORCE plus, becoming the youngest person, the first African-American and the first woman to hold this top position. WORKFORCE plus provides leadership and support for a workforce development system throughout Gadsden, Leon and Wakulla Counties. In her position as Chief Executive Officer, Ms. Moore is responsible for a $6 million budget, a staff of eleven and 55 employees under contract.

Jeffery Murfree is the director of Prek-12 STEM Educator Professional Development for the Teacher Resource Network/The Teacher Channel. Jeff has 18+ years of experience working in the prek-12 STEM education community and has strong relationships with this community and its national partners. Jeff has provided professional development in STEM to teachers, students and school and school system administrators throughout the country. He is a former poultry scientist and high school science teacher. His ten years working for SECME, highlights his career working with under-served populations and women, preparing them for entrance into STEM education and careers.

APPENDIX D

FCR-STEM Female and Minority Initiative Work Group Members

Ava D. Innerarity Rosales is an Instructional Supervisor for Miami-Dade County Public Schools (M-DCPS) Curriculum and Instruction (Science) and an adjunct professor for Miami Dade College. She is currently a doctoral candidate at Curtin University of Technology, Perth, Australia researching the effects of pre-college programs on the attitudes and achievement of minority students in mathematics and science. For the past 20 years, Ms. Rosales has worked with M-DCPS as a science teacher and instructional leader. During her tenure with the district, she has been the district liaison for the Museum of Science Girls Raising Interest in Science and Engineering (RISE) program and coordinated SECME (formerly the Southeastern Consortium for Minorities in Engineering) district-wide, while collaboratively securing over $1 million to support pre-college STEM programs for M-DCPS minority students, teachers, and parents.

Berrin Tansel is the Associate Director of Center for Diversity in Engineering and Computing at Florida International University and an associate professor of Civil and Environmental Engineering. Dr. Tansel was named the 2007 Engineer of the Year by the American Society of Civil Engineers Miami-Dade Branch. She is an elected Fellow of the American Society of Civil Engineers (ASCE), an elected Diplomate of American Academy of Water Resources Engineers, and a Board Certified Environmental Engineer by the American Academy of Environmental Engineers. Before joining FIU, Dr. Tansel worked at the Massachusetts Water Resources Authority on the Boston Harbor clean up project and the Center for Environmental Management at Tufts University. She has been a consultant for PEER Consultants, Soap and Detergent Association, SCS Engineers, City of Pompano Beach, and ERM-South.

Sylvia Wilson Thomas is Assistant Dean in the College of Engineering at the University of South Florida, where she strengthens relationships and programs with industry, government and academia to increase the quantity, quality and diversity of students, faculty and staff. She has been a strong advocate for women in engineering as an instructor and mentor of engineering students, speaker for the Girl Scouts and parent-teacher organizations, and member of the Osceola High School Engineering Academy Advisory Board. Dr. Thomas also serves on the Florida Education Fund Board of Directors and works with the Society of Women Engineers (SWE), National Society of Black Engineers (NSBE), Society of Hispanic Professional Engineers (SHPE), the IEEE Women Affinity group, Junior Engineering Technical Society (JETS), National Engineer's Week, First Robotics, and other student organizations.

Sharisse Turnbull is a graduate assistant at FCR-STEM, where she has provided research support for projects related to Florida's new math and science standards and a professional development initiative designed to help teachers improve their instruction in the science and mathematics content areas. Sharisse was introduced to opportunities in the STEM field as a high school student. While completing her bachelor's degree in Industrial Engineering, she worked at NAVSEA as a co-op student and Human Factors Engineering Trainee. Currently, she is completing a Master's degree in Instructional Systems Design at Florida State University. Her long-term interests are improving student learning and instruction in mathematics on a broad scale and expanding STEM opportunities for females and minorities.

APPENDIX D

FCR-STEM Female and Minority Initiative Work Group Members

Female & Minority Initiative Staff
Florida Center for Research in Science, Technology, Engineering and Mathematics
Florida State University

Laura Hassler Lang is the Director of the Learning Systems Institute and Associate Professor of Educational Leadership and Policy Studies at Florida State University. She is a co-principal investigator for the new state-funded Florida Center for Research in Science, Technology, Engineering and Mathematics (FCR-STEM), a co-principal investigator for Florida PROMiSE, a new math and science partnership created to support teachers and principals in the adoption of Florida's new mathematics and science standards, and a former middle school principal and special education teacher in Florida. Dr. Lang's research focuses on improving learning and performance in K-12 schools, with an emphasis on instructional leadership, professional development, data-driven decision making and interventions related to reading, science and mathematics.

Faye Jones is the project manager for the Female and Minority Initiative at FCR-STEM. She is a doctoral candidate in the Department of Educational Leadership and Policy Studies and the higher education program at Florida State University, where her research has focused on higher education administration, departmental productivity, leadership and gender/race differences in choice and persistence in postsecondary education. Faye has over 10 years of professional experience in higher education management in finance, budgeting, human resources, auditing, evaluation, and performance monitoring of individual faculty and academic departments.

W. Joshua Rew is a graduate assistant for the Female and Minority Initiative at the FCR-STEM. He is a doctoral student in the Socio-cultural and International Development Education Studies program at Florida State University, where he is studying the effects of school leadership on student achievement and organizational performance in developing countries and the relationship between education inequality and socio-economic status in Vietnam, South Africa, and the United States.

Christine Johnson is Assistant Director for Administration at FCR-STEM. She has over 25 years of experience in public policy, research, evaluation, and program administration related to education and human services. For the past eight years, she has managed policy, research and technical assistance projects related to K-12 education and welfare reform at the FSU Learning Systems Institute, including the $1.5 million Multi-University Reading, Mathematics and Science Initiative (MURMSI).

Danielle Sherdan is the Assistant Director for Technical Assistance at FCRSTEM, where she has been working with the Florida Department of Education and Florida's school districts on the implementation of Florida's new mathematics and science standards and designing professional development for principals and teachers. Dr. Sherdan holds a doctorate in Biological Science from Florida State University, with a specialization in plant physiology and molecular biology and has taught elementary and middle school science as a National Science Foundation Graduate K-12 Fellow.

P-3: THE PRISM PROJECT

The PRISM Project unites business and educational communities in **P**romoting **R**egional **I**mprovement in **S**cience and **M**ath – it is a STEM (Science, Technology, Engineering, and Math) initiative. PRISM works collaboratively with the Central Florida School Boards' Coalition – made up of ten school districts serving over 830,000 students.

The Vision is to make Central Florida the state and global leader in science and mathematics education leading to more STEM related businesses and employment. Its Mission is to enhance Kindergarten through 12th grade STEM education and increase the supply of post secondary STEM graduates critical to retain related businesses and industries.

THE BUSINESS CASE

John Glenn, Commission Chairman, National Commission on Mathematics and Science Teaching for the 21st Century stated, "*...the future of our nation and people depends not just on how well we educate our children generally, but on how well we educate them in mathematics and science specifically.*"

STEM related industries are critical to our future community, state, and national economic growth and national security. STEM related businesses and industries are struggling to find qualified employees to meet growing needs – students are missing opportunities to fill these needs and realize the earnings and quality of life opportunities they provide.

THE PRISM PROJECT METRICS

PRISM objectives focus on specific learner outcomes developed jointly with the participating school districts – aiming to increase enrollments in higher level math and science courses as well as State and National examination results – and sharing accountability for success. We will judge success against a long list of improvements ranging from enrollment in International Baccalaureate and Advanced Placement programs to improved scores on standardized tests to completion of higher math and science courses in earlier grades to increased participation in state and national science competitions.

THE PRISM PARTNERS

PRISM'S growing list of partners are: Central Florida School Boards' Coalition, Florida High Tech Corridor Council, Orlando Science Center, Workforce Central Florida, Orlando Regional Chamber of Commerce, Lake Sumter Community College, Lockheed Martin, Electronic Arts, National Retail Properties, Progress Energy, Realty Capital, Regions Bank, Walt Disney World, University of Central Florida, Valencia Community College, Seminole State College of Florida, DeVry University, Daytona College, and the Florida Department of Education.

PRISM STRATEGIES
AUGMENTING K-12 STEM TEACHING AND CURRICULUM

We believe STEM education success will be driven by public-private partnerships between business and industry and our school systems. To this end, we link the business community to school leaders, teachers, and students through recognition and reward programs, internships, and outstanding STEM education lesson plans and classroom practices to help students learn relevant science and math concepts leading to exciting and rewarding STEM higher education and career opportunities.

PRISM's strategies are:

- Recognize outstanding math and science teachers who share best practices with other teachers within their districts and include selected best practice presentations on the PRISM Repository

- Select and compensate a special group of these honored teachers to:
  - *Serve industrial internships at leading Florida technology companies* to enhance practical industrial knowledge and share it with other teachers throughout the region
  - Demonstrate and lecture on specific STEM areas of expertise and interest and include in the PRISM Repository
  - Work with leading technology companies to identify key knowledge, attitudes, and skills needed for selected job categories and link to college requirements and K-12 programs

- Establish PRISM as a primary conduit for STEM outreach between industry and the school districts in doing the following:
  - Establish a STEM outreach program aligned and integrated into the schools' curriculum plan, and assist in training for its use, and provide the *mechanism to scale the magnitude and breadth of Industry outreach.*
  - Develop a set of compelling in-school science projects and lectures, geared at inspiring students to pursue careers in STEM-related fields. Create "shrink-wrapped" demonstration materials for affordable, scalable deployment. Leverage PRISM industry partners to provide compelling role models for in-class presentations.
  - Establish linkage between STEM formal education goals and informal learning objectives, enabling area organizations (Orlando Science Center, etc.) to provide content and facilitate outreach.
  - Leverage existing successes by partnering with best of breed ongoing projects and organizations (for example, UCF's ISTF program)

- Develop a PRISM repository of experiments and best practices that can be easily utilized across the region. Organize and "key-word tag" the repository content by learning objectives, subject matter, and grade applicability for easy utilization.

- Provide incentive programs for students to take more higher level math and science courses and compete in regional, state, and national competitions

    - Recognize outstanding and most improved math and science students beginning in middle school who meet special PRISM Scholar criteria for academic rigor and success.
    - Select and compensate a special group of students to serve internships in STEM industries after eleventh grade and have them share their experiences with fellow students
    - Provide matching funds for middle and/or high school students to participate in math, science, and engineering competitions and incorporate projects for recognition on the PRISM Repository

WHY SHOULD YOU GET INVOLVED WITH PRISM?

In the past three years, it has recognized 92 outstanding math and science teachers who shared best practices with other teachers in their districts and 170 outstanding and most improved students. Seventy-five thousand dollars in matching grants have been provided to districts helping them increase middle school student participation by thousands of students in science and math competitions. And these recognitions are leveraging the use of more hands on, relevant teaching and student learning.

WHAT MAKES PRISM ONE OF A KIND?

- PRISM is a unique regional partnership of businesses and ten school districts working as partners now to enhance STEM teaching and learning.

- PRISM is unique in having an honored corps of outstanding teachers prepared to work with business persons to improve and integrate more effectively their current STEM education programs in the schools.

- PRISM is unique in having an honored corps of outstanding teachers prepared to share best practices in STEM education directly linked to workforce needs.

- PRISM is unique in having an honored corps of outstanding and most improved middle and high school students prepared to share their work and experiences with fellow students.

- PRISM is unique in having a Committee of instructional leaders from ten school districts meeting every other month with PRISM members to help assess progress of current programs, identify future needs, and insure PRISM program implementation.

- PRISM is unique in having student goals and objectives and means of assessment jointly framed by both business and school districts driving its planning and system of accountability.

R-1 - REFERENCES

Balfanz, R. (2007). *More information on the methodology, data, and terms used in the AP dropout factory story*. Retrieved from http://web.jhu.edu/CSOS/images/AP.html.

Chen, X. (2009). *Students who study science, technology, engineering, and mathematics (STEM) in postsecondary education*, Stats in Brief, NCES 2009-161. (ERIC Document Reproduction Service No.ED506035). Retrieved from http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/44/b5/71.pdf.

Cohen, M. & Ginsburg, A. (2001). *School improvement report: Executive order on actions for turning around low-performing schools*. Retrieved from http://www.ed.gov/offices/OUS/PES/lpschools.pdf.

Corallo, C. & McDonald, D.H. (2002). *What works with low-performing schools: A review of research*. Retrieved from http://www.edvantia.org/products/pdf/WhatWorks.pdf.

Dougherty, C. & Mellor, L. (2007). Data requirements for a coherent P-16 system. *From Minding the gap: Why integrating high school with college makes sense and how to do it.* National Center for Educational Achievement. pp. 233-238. Retrieved from http://www.dataqualitycampaign.org/files/publications-data_requirement_for_a_coherent_p-16_system-010107.pdf.

Education Week (2010). *Quality counts annual report 2010.* Retrieved from http://www.edweek.org/ew/index.html.

Epstein, J.L. (1987). Toward a theory of family-school connections: Teacher practices and parent involvement. In K. Hurrelmann, F. Kaufmann, & F. Losel (Eds.), *Social intervention: Potential and constraints* (pp. 121-136). New York: DeGruyter.

Epstein, J.L. (1995). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan*, 76(9), 701-712.

Jones, B.A., Elam, D., & Nichols, E.J. (2009, forthcoming). *Cultural competency in public education: Implications for policy and decision-making in our schools, districts and communities*. Charlotte, NC: Information Age Publishing.

Justice Policy Institute (2007). *Education and public safety*. Washington, DC: Retrieved from http://www.justicepolicy.org/images/upload/07-08_REP_EducationAndPublicSafety_PS-AC.pdf.

Laird, E. & Ryan, R. (2008). *Data governance: Changing culture, breaking down silos and deciding who is in control*. Data Quality Campaign. Retrieved from http://www.dataqualitycampaign.org/files/meetings-dqc_quarterly_issue_brief-072908.pdf.

National Council for Teacher Quality (2008). *State teacher policy yearbook: What states can do to retain effective teachers.* The National Council for Teacher Quality. Retrieved from http://www.nctq.org/stpy08/reports/stpy_national.pdf.

New Leaders for New Schools (2009). *Principal effectiveness: A new principalship to drive student achievement, teacher effectiveness, and school turnarounds with key insights from UEF.* Retrieved from http://www.nlns.org/uef.jsp.

Sanders, M. & Sheldon, S. (2009). *Principals matter: A guide to school, family and community partnership*. Corwin Press, Thousand Oaks, CA.

Spielhagan, F. (2006). Closing the achievement gap in math: The long-term effects of eighth-grade algebra. *Journal of Advanced Academics.* 18(1), 34-9.

Watson, J., Gemin, B., Ryan, J. & Wick, M. (2009). *Keeping pace with K-12 online learning.* Evergreen Education. Retrieved from http://www.kpk12.com/downloads/KeepingPace09-fullreport.pdf.

Appendix X-1 - Allocation of Race to the Top - 50% For Participating Districts

Agency Numbers	School Districts	LEA Percent of Title I Funds	Allocation
010	ALACHUA	1.37290%	7,836,698
015	P.K. YONGE SCHOOL	0.02275%	129,831
020	BAKER	0.17531%	1,000,679
030	BAY	1.18335%	6,754,678
040	BRADFORD		
050	BREVARD	2.47065%	14,102,755
060	BROWARD		
070	CALHOUN	0.10815%	617,311
080	CHARLOTTE	0.47901%	2,734,229
090	CITRUS	0.69159%	3,947,675
100	CLAY	0.60947%	3,478,926
110	COLLIER		
120	COLUMBIA	0.49088%	2,802,018
130	DADE	22.61308%	129,078,055
140	DESOTO	0.38206%	2,180,827
150	DIXIE	0.15080%	860,764
160	DUVAL	7.31483%	41,753,901
170	ESCAMBIA	2.75771%	15,741,319
180	FLAGLER	0.28922%	1,650,923
190	FRANKLIN	0.08156%	465,552
200	GADSDEN	0.57645%	3,290,421
210	GILCHRIST	0.10543%	601,802
220	GLADES	0.06236%	355,984
230	GULF	0.08682%	495,565
240	HAMILTON	0.15478%	883,478
250	HARDEE	0.37294%	2,128,798
260	HENDRY	0.47775%	2,727,055
270	HERNANDO	0.76985%	4,394,411
280	HIGHLANDS	0.78283%	4,468,504
290	HILLSBOROUGH	8.44300%	48,193,586
300	HOLMES		
310	INDIAN RIVER	0.59104%	3,373,706
320	JACKSON	0.32348%	1,846,435
330	JEFFERSON	0.09033%	515,642
340	LAFAYETTE	0.06347%	362,268
350	LAKE	1.39567%	7,966,621
360	LEE		
370	LEON	1.26720%	7,233,343
685	FAMU LAB SCHOOL	0.01857%	106,019
686	FSU LAB SCHOOL		
380	LEVY	0.39704%	2,266,334
390	LIBERTY	0.05680%	324,236
400	MADISON	0.19777%	1,128,880
410	MANATEE	1.72305%	9,835,364
420	MARION	2.27284%	12,973,654
430	MARTIN	0.44771%	2,555,566
440	MONROE	0.25257%	1,441,691
450	NASSAU	0.24560%	1,401,919
460	OKALOOSA	0.86289%	4,925,494
470	OKEECHOBEE		
480	ORANGE	7.77146%	44,360,402
490	OSCEOLA	1.94150%	11,082,281
500	PALM BEACH	7.20370%	41,119,515
687	HENDERSON SCHOOL	0.08771%	500,673
510	PASCO	2.82483%	16,124,431
520	PINELLAS	5.11352%	29,188,542
530	POLK		
540	PUTNAM	0.85377%	4,873,398
550	ST. JOHNS	0.40123%	2,290,240
560	ST. LUCIE	1.68395%	9,612,203
570	SANTA ROSA	0.66647%	3,804,302
580	SARASOTA	1.13540%	6,481,012
590	SEMINOLE	1.66690%	9,514,876
600	SUMTER	0.38228%	2,182,112
610	SUWANNEE	0.35637%	2,034,226
620	TAYLOR	0.17373%	991,668
630	UNION	0.07845%	447,792
640	VOLUSIA	3.78769%	21,620,592
650	WAKULLA	0.13282%	758,149
660	WALTON	0.28943%	1,652,115
670	WASHINGTON	0.18223%	1,040,185
557	SCHOOL DEAF/BLIND	0.03500%	199,804
TOTAL		100.00000%	$ 570,811,435