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Priority 1—Need for Assistance

(a) The costs of fully implementing the magnet schools project as proposed

Need for Desegregation – The proposed *EduSTEM* magnet programs are necessary to maintain the Polk school district’s voluntary desegregation. The “Black and nonBlack” racial quotas from the 1954 U.S. Supreme Court were replaced by the June 2007 ruling that schools may not determine student admissions by race alone. Polk’s replacement system of random student selection for magnets over the next two years proved inadequate to insure continued balance in diversity over time. Membership trended toward having disadvantaged subgroups underrepresented in magnets. Meanwhile, Polk’s Hispanic membership has nearly doubled, from 16.2% of 83,000 students in 2004 to 29.5% of 94,500 students in 2013.

The School Board of Polk County, Florida (the district’s legal name, hereafter “Polk” or “the district”) became the defendant in a desegregation lawsuit in 1963. Over the next four decades, the district attempted to desegregate via freedom of choice (1960s), fixed attendance zones (1970s), clusters of schools or single-grade centers serving students across communities, and finally magnet schools in the 1990s. In March of 2000, the federal court granted unitary status to the district, and put into place a Settlement Agreement by which the district maintains the progress made in diversified student and staff assignments and equitable facilities.

Growth and shifting demographics over the past decade have resulted in select schools having concentrations of Hispanic students. Also, the district follows updated federal procedures patterned after the U.S. Census, which counts Hispanics more accurately as a culture not specific to race, further boosting reported Hispanic membership. *Hispanics in Polk’s magnets will be even more underrepresented than they appear now, and more concentrated in potential feeder schools, unless the district takes action.*

Need for STEM Pipeline – Polk County’s business community is demanding increased student performance to help feed the local economy by providing well-prepared workers. Polk Vision, a civic initiative with professional staff, has held exhaustive public meetings to develop a communitywide plan for increasing the local quality of life. Education is a top strategy, with objectives to increase the high school graduation rate, college-educated workforce, and overall literacy.¹ Civic leadership and locally elected boards have aligned their plans to Polk Vision. One result was business sponsorship of a middle school International Baccalaureate program. Businesses donated \$150,000 in seed money for training and materials. On June 20, 2012, Lawton Chiles Middle Academy became one of the Southeast’s first to offer the International Baccalaureate Middle Years Programme. (The spelling is European, from its origin.) The district operates two International Baccalaureate high schools that stay at capacity.

Polk County has a history of cattle ranching, citrus production phosphate strip mining and tourism. Times have changed. Legoland, offering mechanical and mathematical engineering activities for local students through construction and robotics, has replaced Southern belles at the former site of Cypress Gardens. CSX, a railroad transport company, has a new terminal and logistics center (rail to truck) under construction in Winter Haven, Polk’s second-largest city. Polk has the state’s largest concentration of rail lines, serving Tampa and Orlando, with warehousing and distribution centers along Interstate-4 that use sophisticated, electronic controls for inventory and shipping. The Publix Supermarkets headquarters in Polk’s largest city, Lakeland, provides IT and marketing research services throughout the chain. These industries require graduates with strong background in STEM.



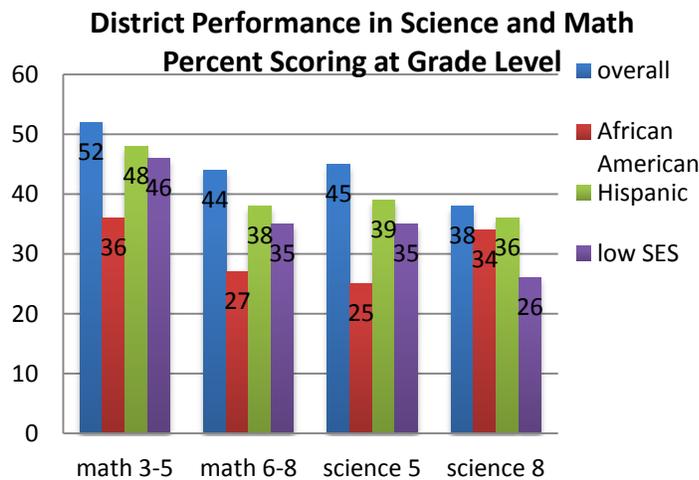
Two major IT providers operate from Polk: Inland Fiber & Data in Winter Haven; and

¹Polk Vision <http://polkvision.com/about-polkvision/>

DSM Technology Consultants in Lakeland, with branch centers in Orlando and Atlanta. All of these companies have workers commuting from the Tampa and Orlando areas for lack of sufficient manpower with the high skills that they need in the local workforce.

Lakeland Regional Medical Center recently affiliated with the University of South Florida’s medical college to become a medical teaching center. Two of the nation’s leading robotic micro-surgeons practice locally, and Polk State College is home to the first nationally credentialed program for nurses and technicians in robotic-assisted surgery. Florida Polytechnic University, part of the state university system, is under construction in Lakeland.

Need for Improved Student STEM Preparation – While high tech development is rich with models for students to see STEM lessons applied in the local workforce, Polk’s industrial community has reason to pressure the school system for improvements. This year the Florida Department of Education ranked Polk 59th in student performance, out of Florida’s 67 districts.²



The data shows schools need improvement in math and science, with minority groups especially vulnerable. This chart shows disparities between subgroups in math and science test results, and a decline in school performance as students

² <https://app2.fldoe.org/Ranking/Districts/>, based on percent scoring at grade level on the standardized Florida Comprehensive Assessment Test in grades 3-10 reading, math and writing

progress through the grades.³

In 2012, only 44% of Polk Algebra I students passed the state-required, end-of-course Algebra I exam. Passing will be a new graduation requirement for our current freshmen, and next year's freshmen will also have to pass exams at the end of courses in Algebra II, Biology, and either Chemistry or Physics. *Fewer than 30% of Polk's current high school students even participate in Algebra II or a science beyond Biology.* Last year 76% of Polk's 10th graders attempted the Biology I exam. Pass/fail scores were not yet determined by the state, which instead reported how many students scored in the top, middle, or bottom third compared to their statewide peers. Polk had 44% score in the lowest third. The district's Strategic Plan upgraded expectations to avoid a graduation dropoff, and accelerates academic rigor. *EduSTEM* provides the prerequisite STEM instruction starting in the earliest grades.

Florida is one of the top five states for growth in STEM-related employment.⁴ STEMFlorida projects that in the next 10 years, 80% of new jobs in Florida will demand STEM preparation: jobs that require college education, and also highly skilled tradesmen. These inspired Polk's planning team to refer to our need for education in Science, Technology, Engineering and Mathematics as our *EduSTEM* project.

Proposed Project

To meet the needs spelled out by our community, and to reduce minority isolation from our growing Hispanic population, *EduSTEM* will institute the following new programs.

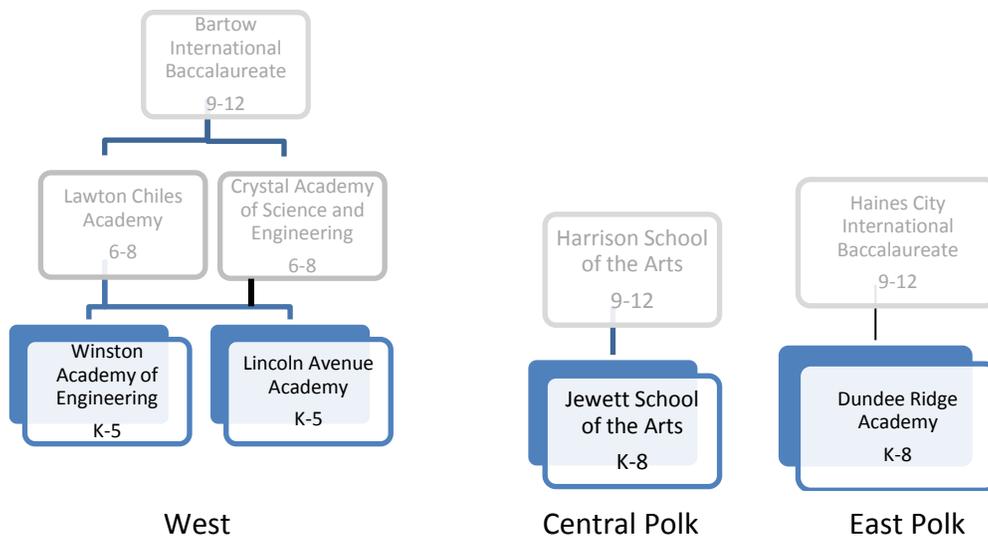
³ Data Source: Florida Department of Education, Student Performance Results: Demographic Report (2012)

⁴Central Florida Development Council: <http://www.cfdc.org/innovations/research-engineering-other-high-tech/>

Summary: EduSTEM New and Revised Magnet Schools (total 2,782 seats, 2,208 new)

	Winston	Dundee Ridge	Lincoln Avenue	Jewett Arts
Old model	K-5 Traditional	6-8 Traditional	K-5 STEM Magnet	K-8 Arts Choice
Magnet Grades	K-5	K-8	K-5	K-8
STEM	X	X	X in place	X
International Baccalaureate		Primary Years, Middle Years	Primary Years	
Magnet starts January 2014			X Revised 554 seats	X New 728 seats
Magnet Opens August 2014	X New 554 seats	X New 926 seats		
Attractors	Replication of STEM from Lincoln Avenue	STEM inquiry / global issues	STEM inquiry / global issues	Interdisciplinary STEAM (STEM- infused Arts)
Features	Discovery Lab, hydroponics	Agriscience lab, Fabrication Lab, Language Lab, graphic arts	Greenhouse to enhance STEM lab, Outdoor classes	Fabrication lab
Choice Area	Lakeland	Haines City	Lakeland	Winter Haven

The following graph shows where the new magnet students will matriculate.



(b) The resources available to the applicant to carry out the project if funds under the program were not provided

Excellent Fiscal and Asset Management – Without a magnet grant, Polk will not be able to afford *EduSTEM*, due to the financial situation described below. The district’s lack of funds is not from a lack of fiscal management. Other districts in Florida have closed schools and/or laid off teachers over the past several years and to comply with Florida’s costly Class Size Reduction amendment to the state constitution. Polk has complied without closing schools or laying off teachers. Grades K-3 are limited to 18 students, grades 4-8 core courses to 22, and high school to 25. The Florida Department of Education reports Polk is consistently among the best of Florida districts at directing dollars to the classroom. Polk ranks low in administrative costs, 62nd out of the 67 districts.⁵ Polk’s pupil transportation efficiency ranks 11th highest.⁶

Costs Paid by Polk - The district already commits supplemental teaching positions to maintain the attractors in eight magnet schools. The district also commits an annual \$1.9

⁵ <http://www.fldoe.org/fefp/AdministrativeExpenditures.asp>

⁶ <http://www.fldoe.org/transportation/pdf/Profiles1011.pdf>

million+ to bus magnet and choice students within four, established choice zones.

The district distributes Title II funds (federal categorical for professional development) to Polk schools according to their numbers of students, to use in support of approved school improvement plans. These annual funds are insufficient to support new projects of the scope proposed here: \$2,765 at Winston, \$2,835 at Lincoln, \$4,960 at Dundee Ridge, and \$3,680 at Jewett School of the Arts—leaving a shortfall of \$2,685,939 over the coming three years to adequately instill a true, sustainable reform of the magnitude to fulfill *EduSTEM* purposes.

Dundee Ridge Middle School in east Polk County currently serves 1,000 middle school students in grades 6 – 8. Based on community input and parent concerns, Polk is reconfiguring school zoning in the eastern portion of the county resulting in 600 of these students being rezoned to community schools closer to where they live. Lacking other action, this will leave the campus significantly under-populated. In addition, this is the only quadrant of the county that does not offer an International Baccalaureate feeder to the available high school program.

Dundee Ridge Middle School is part of the feeder pattern for Haines City High School, 8.5 miles away (e.g., very close in a district this size). The planned rezoning offers a unique opportunity to create a K-8 magnet school feeding to the International Baccalaureate high school.

(c) The extent to which the costs of the project exceed the applicant's resources

Polk's current financial climate, described below, does not allow for local funds to expand or enhance programs. Since Florida has no income tax, schools depend heavily on property and sales tax revenues. In the recent economic downturn, Florida's unemployment and foreclosure rates were surpassed only by Nevada. Polk was one of the most severely affected parts of the state, directly reducing revenues for schools. This economy greatly curtailed district funds at the same time student and family needs have grown exponentially.

In the past six years, Polk’s school taxable property value dropped by \$6.4 million, or 19.84%. State funding dropped by 12% in the same period, and local funding by 11%, for a combined loss of \$76.9 million. Capital funding dropped by 56%, from \$450.5 million to \$198.8 million. The district cut \$6.2 million in 161 non-classroom positions, ranging from administrators and accountants to bus drivers and maintenance. (Budget cut details are attached.)

Charter schools, encouraged by Florida Legislation, have flourished during the same five years, growing in Polk by 2,060 students. This channels an additional \$9,063,645 from the annual district budget to charter schools, though cost savings from fewer students are less.

In addition to these painful reductions, the district is cutting \$18 million+ in 2013-14 to fund teacher raises. Next year secondary schools will reschedule to curtail electives and reduce 191 teachers by attrition, so that this year’s raises are sustained. The district imposed a hiring freeze effective January 11, 2013, with new vacancies now filled by long-term substitutes, to create openings for displaced teachers in the fall.

(d) The difficulty of effectively carrying out the approved plan and the project for which assistance is sought, including consideration of how the design of the magnet schools project— e.g., the type of program proposed, the location of the magnet school within the LEA—impacts on the applicant’s ability to successfully carry out the approved plan

Inner-city Poverty - Three *EduSTEM* magnets will be located in urban neighborhoods comparable to large, metropolitan, inner cities in terms of minority predominance, poverty, rates of imprisonment, and crime victims. In a national comparison of school districts, Polk is the 30th largest. In our state, Polk is Florida’s seventh largest, but poorest of the top seven in terms of school-age children in poverty.⁷ In fact, in all the nation’s largest 30, only seven districts are

⁷ Polk ranks in size between Detroit City and Albuquerque districts. The larger districts in Florida house Miami, Ft. Lauderdale, Tampa, Orlando, Palm Beach, Jacksonville, St. Petersburg.

poorer.⁸ There are 37 known homeless students in three of the four **EduSTEM** schools.

Winston Elementary, proposed for reopening as a magnet, qualified for a grade of “F” this year under Florida’s grading system, but for a one-time, one-year grace period granted by the state.

Recently the Winston Elementary School Advisory Council (defined later) sent out a questionnaire to ask how the school could be improved. Out of that survey came the decision to apply to be a school of choice. The School Board could not move forward with this, however, because of the district’s current financial situation. The teachers and the community have always advocated for Winston to be a school of choice. They have a long-term commitment to the hard work of implementing a rigorous academic choice program and are located in an area where it is difficult to attract diverse students.

Meanwhile, the waiting list at Lincoln Avenue Academy is consistently twice the size of the entire school enrollment; we could double the size of the school and still have a waiting list. The proposed Winston Academy of Engineering will feed to the same middle school magnet as Lincoln Avenue Academy, where capacity is sufficient to serve both. Therefore, the Winston parents see this as an ideal opportunity to help revitalize the local community.

Polk’s free lunch rate was 70% at the end of 2011-212, compared to 58% in Florida and 66% in the U.S.⁹ *Nearly a third of Polk’s children younger than five live below the poverty level.*

Rural Poverty – The fourth **EduSTEM** magnet will be located in rural Polk. One of Florida’s greatest concentrations of Mexican citrus harvesters dominated this area for decades.

⁸ In the largest 30 nationally, the only poorer districts (in order) are Dallas, Memphis, Philadelphia City, Chicago, Houston, New York and Los Angeles.

⁹ Florida Education Information & Accountability Services,

<http://www.fldoe.org/eias/eiaspubs/pubstudent.asp>; <http://www.fns.usda.gov/pd/slsummar.htm>

Our Hispanic population now includes significant groups of Cubans, Puerto Ricans and South Americans, outnumbering the black population that swelled with Haitian “boat people” in the 1990s. Unemployment exceeded 12% for 19 individual months since mid-2009. In 2010, the Brookings Institution reported Polk County had the nation’s fifth-highest rate of *suburban* poverty.¹⁰

Last year, parents who live in Poinciana, a large, planned community near Haines City, submitted a charter school application to the Polk School Board. Accompanied by more than 200 letters of support, the group petitioned for the new school in their community because their children were being bused as far as 20 miles to the nearest public schools. The School Board has proposed instead to construct a new school in Poinciana. In light of this plan, the parent group has withdrawn its charter application. This will mean about 600 seats at Dundee Ridge Middle School will be vacated, creating the opportunity to attract non-Hispanic students to that campus to diversify its enrollment in the future.

Low Literacy - Only Miami-Dade, among Florida's metropolitan districts, has a lower rate of resident adults with diplomas, but Dade's rate of college graduates is far higher.¹¹ Polk parents are less able to help their children with school work, and schools struggle to find literate volunteer tutors. Polk competes with higher pay in neighboring districts to attract teachers.

<i>2006-2010 ACS estimates</i>	Polk	Florida	U.S.
Adults 25+ with no diploma	18.0%	14.3%	15.5%
Median Household Income	\$41,174	\$44,409	\$50,046

¹⁰ The Suburbanization of Poverty: Trends in Metropolitan

America <http://www.brookings.edu/research/papers/2010/01/20-poverty-kneebone>

¹¹ America Community Survey, U.S. Census Bureau

Diversity - Polk’s PreK-12 student body of 94,000 became “majority minority” in the past two years, now 46% white, 22% Black and 29% Hispanic. ***EduSTEM*** will draw from these demographic groups and thus include a large group of disadvantaged and underrepresented children in magnets. This population especially needs capable teachers challenging them to learn higher order thinking skills and supporting them to master our state standards that have raised graduation requirements.

EduSTEM will provide capacity for change that the targeted schools cannot otherwise afford. Further, this proposal describes how the Dundee Ridge campus, without the new magnet, will be grossly underutilized and will not overcome minority group isolation for Hispanics.

Priority 2, New or revised magnet schools projects, and Priority 3, Selection of students, appear in Tables 6 and 5

Priority 4—Promoting Science, Technology, Engineering, and Mathematics

(a) Providing students with increased access to rigorous and engaging coursework in STEM

EduSTEM will:

- Create rigorous STEM programs in each of our choice zones, with seamless K-12 feeder patterns.
- Build high-demand programs that attract the interest of all students, including girls, minority group members, and students with disabilities.
- Develop a curriculum aligned to the needs of industry and higher education, anchored in standards (including those in the Next Generation .Science Standards), and focused on application and higher level thinking.
- Provide intensive training to create a cadre of model STEM teachers and administrators who can sustain STEM reforms in our district (discussed in 4b).

Serving the Entire District - Polk County is divided into four choice zones: Lakeland, Winter Haven, Bartow, and Haines City. The four **EduSTEM** magnets will complete continuums of K-8 STEM education in each zone. Just as Polk's older magnets set the standard for school technology in the 1990s, **EduSTEM** will establish model STEM infusion programs and teacher cadres that can lead the process of systemic improvement throughout our district. The K-8 focus will improve student math and science performance to feed STEM success in high school and beyond. Our high school programs need these feeder STEM continuums to provide earlier student engagement so that we lose fewer children in poverty.

Attracting diverse students to our STEM programs - The January 2013 report by STEM Connector notes "arguably the most concerning trend with students interested in STEM is the increasing gender gap. Female students express an interest in these fields at 14.5%, compared to the 39.6% of males." The report found that in colleges nationwide more than 50% of those enrolled in STEM programs are white, while only 14.5% are Hispanic and 12.2 % are black. This matches findings by the National Science Foundation's National Survey of Recent College Graduates in 2008. That report said United States colleges of engineering awarded only 17% diplomas to women, 5% of diplomas to African Americans and 10% to Hispanics.

To assure attractiveness of our new STEM-rich programs to diverse populations, **EduSTEM** will feature themes in which students transfer knowledge and apply science, technology, engineering and mathematics within various contexts. Infusing STEM in a variety of magnet themes (such as IB, arts or engineering) will help attract diverse students, as well as offer an opportunity to develop a dynamic, rigorous, high interest curriculum. The **EduSTEM** approach will teach habits of the mind so that children see that the disciplines can be applied with limitless applications. This is particularly important to assure those from groups

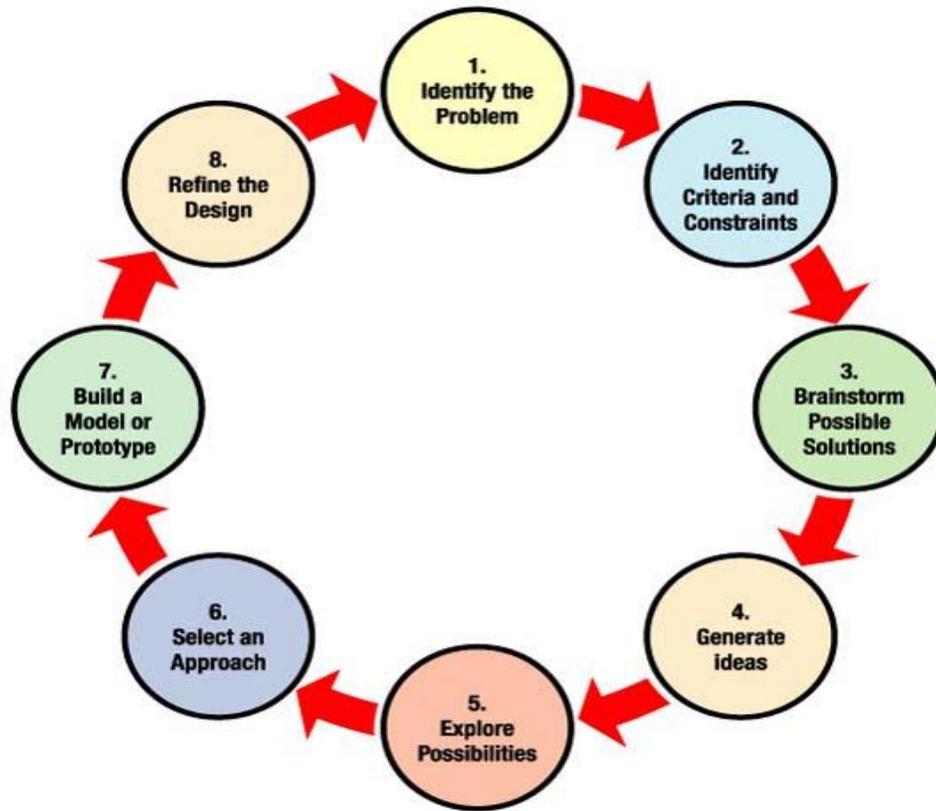
underrepresented in technology, engineering, science and math careers, develop an understanding of how STEM connects to their areas of interest and choices for the future.

EduSTEM magnets will also present the Primary Years (elementary) and Middle Years (middle school) IB programs for global focus and dual language instruction to appeal to Polk's Hispanic population while infusing the program with STEM applications and connections.

Rigorous STEM Curriculum Design - *EduSTEM* will use engineering and the design cycle as a central way of learning and thinking about science, math and technology to solve inquiry-based problems. Teachers will present engineering as a broad discipline through which all other subject areas and disciplines are applied in the real world. To create rigorous, inclusive programs, the new magnets will develop standard-based units that incorporate STEM focus in their respective themes through the engineering design process as a method of critical thinking, searching for real life solutions and emphasizing diverse options of STEM careers. This approach will transform traditional compartmentalized approaches to science and math curriculum into a dynamic interdisciplinary, applied approach carried across all instructional areas. The pedagogy shift will increase a deep understanding of the curriculum, with focus on students integrating information, applying concepts and developing ability to think critically while generalizing knowledge through application.

EduSTEM starts with the framework for the Next Generation Sunshine State Standards for Science and Engineering Practices, and the National Science Teachers Association definition of STEM as an interdisciplinary approach. The new magnet schools will use the engineering design process to remove traditional boundaries between core subjects, allowing for transfer of knowledge and application of academic skills in science and mathematics.

The engineering design process will use the NASA-developed protocol for engineering solutions adapted for K-8 student use. The engineering design cycle is pictured in the NASA (2009) illustration below.



In an authentic performance task for a Marine Science unit, students will apply concepts in science (properties of materials and changes in matter) and mathematics (angles and measure of area and perimeter) to propose a design for a new, environmentally friendly artificial reef. Another authentic performance task will allow students to will run their own airplane factory. In a social studies unit on economics, students will explore how availability and access to natural resources drives development of profitable industry, as they apply math to develop their company’s budget using spreadsheet software. Students will then develop a prototype of their sustainable airplane using financial constraints predicted through their budget.

EduSTEM will teach students to communicate complex ideas in the wake of their problem solving. Students will grasp interconnecting disciplines rather than learning subject by subject from texts. The Middle Years IB students will study how actions of ancient civilizations impacted the world as they explore IB Human Ingenuity. Students will be challenged to analyze the environmental impact of Roman Civilization and “help” ancient Rome create better solutions for their environmental challenges through better engineering. This unit will teach “the way in which human minds have influenced the world and consider the consequences of human thought and action.” (ibo.org) Google Earth will help them study configuration and urban planning of the ancient Rome, one of several resources to determine ancient Rome’s environmental “footprint.”

Working in teams, students will identify sources of pollution and its consequences on human life such as spread of infectious diseases, applying science standards to a case study. Student-led engineering consulting teams will apply mathematics (such as ratio, slope calculations and statistics) to digitally “rework” a Roman conduit system, making it healthier and environmentally friendly, using animation software (such as Alice or Frames) to overlay the Google Earth Ancient Rome layer. Finally, the teams will use digital tools to present their finding to an outside audience such as architects or historians. The unit will introduce students to a multitude of STEM careers such as graphic arts and design, civil engineering, environmental science and engineering, and engineering economy and anthropology.

EduSTEM schools will offer electives (middle school) or special subjects (elementary) that will allow students to further explore and apply STEM subjects. For example, revision of the elementary magnet program into IB will feature a weekly STEM lab focused on international

mindedness, through exploration of global engineering issues such as habitat destruction, overpopulation and lack of access to clean water. Students can

- investigate the impact of habitat destruction in China, comparing it to the Dust Bowl and proposing engineering solutions to the current global problem.
- explore outdoor biodiversity areas, robotics and science investigations.
- engage with local industries exploring careers and issues. They may devise a product or a process that will stop destruction of agricultural land and water by invasive, nonnative species, a current issue in Central Florida.

The Middle Years IB program offers a Global Technology elective. This unit asks students to answer the essential question, “To what extent does your design affect the product?” The lesson would incorporate the IB area of interaction “Environments: Resources and materials in the environment help in the development of technological products,” and STEM focus, “Engineers use relationships between shape and design.”

Special focus areas such as Graphic Design will allow children to explore engineering fields such as industrial design and architecture. The **EduSTEM** schools with middle grades each will have a Fab Lab (fabrication lab), a digital workshop equipped with laser-cutters, routers, 3D scanners, 3D milling machines, and programming tools. For example, 8th grade students in the Fab Lab can design an ergonomic and aesthetic model of a new chair, with constraints of material, dimensions and cost. Teams of students will research ergonomic aspect of the problem and properties of available materials, propose a design, draft a design, fabricate a prototype and revise their design based on reflection and feedback. This engineering task will require integration of plethora of science and math knowledge – to include human body, properties of materials, number operations for budget, geometry, and measurement. At the same

time, art components will permeate choices of design and aesthetic component.

Students will need to use up to date technology, such as Computer-Aided Design (CAD) software to create computer-based 3D models and a variety of laser-cutter programs to accomplish the task. In addition, enrichment programs at various sites will offer opportunities to participate in robotics, science fairs and other academic competitions in areas of STEM. The goal of the project is to prepare students for success in high school, higher education and work place. Rigor and continuity of use of interdisciplinary approaches with engineering design process as a critical thinking and problem solving component provides students with a foundation of content knowledge and skill to create new solutions. Further descriptions of each program are in Table 6 – New and Revised Magnet School Projects.

Pedagogical Framework for Rigorous STEM Curriculum- The rigor, differentiation and success of ***EduSTEM*** will be assured by infusion of pedagogical best practices. All students will receive quality STEM instruction that will increase their academic performance and will include

- development and implementation of standards-aligned units of study,
- quality assessment process and data driven instruction,
- varied repertoire of research-based instructional strategies and approaches,
- nonfiction writing across curriculum, and
- emphasis on 21st century skills.

(b) Increasing the opportunities for high-quality preparation of, or professional development for, teachers or other educators of STEM subjects
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All ***EduSTEM*** teachers will be highly qualified, Florida certified, and well-trained professionals who have experience working with diverse student populations. Through extensive training and follow-up activities, teachers will learn to implement innovative instructional

strategies described herein. In addition, Dundee Ridge Academy and Lincoln Avenue Academy will have specialized teachers, funded by the school district, with credentials and experience directly related to International Baccalaureate requirements (foreign language, technology).

An innovative and rigorous curriculum such as the Middle Years IB requires teachers to shift their thinking and classroom approach. Often the highest quality teachers have the most difficulty making this shift; it takes repeated and extensive training, monitoring and re-teaching to shift these high quality teachers to a new paradigm in student learning. Therefore, a professional development plan that includes an introduction to the magnet attractors, specific teaching strategies, an overview and implementation tips for key components, and specific, supportive feedback and evaluation is essential to impact student learning.

Comprehensive professional development plans can be found in the attachments. These plans are tentative only with regard to the needs, previous training experiences, and requirements of specific staff members as they are identified. Exploratory teachers, while still completing significant training, may not have as rigorous a commitment in specific training topics as core classroom teachers, so the plan may be slightly modified to meet individual needs of the school and the staff. Essential components of this plan include training for teachers, administrators, the coordinator and the Resource Teacher. Sample components are

- International Baccalaureate Organization training at levels one, two and three;
- in-house support related to implementation (e.g. summative assessment; using the unit planner template; creating powerful unit plans within each subject area);
- systemic reform professional development led by national consultants and then paired with follow-up training led by experienced specialty teachers (e.g. differentiation;

using the district’s Discovery assessment data to drive instruction; formative assessments).

The multi-tiered and comprehensive professional development plan also includes participation in state and national conferences such as the national Association for Supervision and Curriculum Development (ASCD) conference and the Florida League of IB Schools, quarterly meetings and professional development roundtables and the Florida Educator’s Technology Conference. Dundee Ridge Academy will use expert teachers from authorized IB Middle Years Programs to train, model and collaborate with its teachers in order to develop a strong curriculum focused on the importance of communication, global awareness, and real-world applications.

The Magnet Office has set an annual requirement for all ***EduSTEM*** educators to participate in at least 60 hours of professional development, customized at each school. The teachers will be immersed in observing the magnet theme curriculum at work as and learning the underlying research and rationale for each aspect of how they will be expected to teach. Part of the content is pedagogy, specified in the District Improvement Plan and required by the Florida Department of Education. In the attached tables describing professional development plans for each school, this pedagogy is labeled “systemic.”

The attached, school-by-school, professional development plans spell out all training bytopic; purpose; presenter; type and number of participants; project month and year it is scheduled; intended participant outcomes; and students who will be impacted, by grade and by course. Two hundred teachers and administrators will participate.

Training in areas of STEM specific to their teaching assignments will be open to all ***EduSTEM*** teachers. Teachers will practice applied learning to assure that he interdisciplinary

nature of STEM and the process of engineering design are integrated in all themes.

As Florida's new science standards (Next Generation Sunshine State Standards) emphasize engineering applications, all teachers, regardless of subject, will view the National Science Teachers Association series of webinars detailing the new framework, or teacher-led workshops about these standards. All teachers and administrators will use the engineering design process (inquiry-based instruction, applied learning). They will have collaborative planning time to identify interdisciplinary and cross-disciplinary standards they can combine to apply STEM components in a variety of subjects.

For example, as a part of collaborative team planning, teachers will be trained to engage in unwrapping (unpacking) the standards for their specific subjects. As a cross-disciplinary team, teachers of various subjects will look into applicability of standards across curriculum, as they create common assessments and authentic tasks. The district STEM/STEAM coordinator and Resource Teachers will support implementation throughout the project at the schools for math and science teachers, and those implementing interdisciplinary math and science connections. Teachers will have comprehensive training in

- understanding the Common Core State Standards in Math and Language Arts (incorporating literacy in history/social studies, science, mathematics and technical subjects), and
- Next Generation Science Standards (currently released as final draft).

For example, "Five Steps to a Balanced Science Program" will help teachers learn how to help students apply science skills and reasoning to solve genuine problems requiring scientific thought processes aligned to Next Generation Science standards. Teachers in IB Programmes will attend a variety of Level 2 and 3 workshops that emphasize science and math content and

pedagogies. At Jewett Arts, STEM infusion in the arts-themed curriculum will be called “STEAM.” Jewett Arts teachers will attend a local workshop by Heidi Hayes Jacobs, Curriculum 21 Associates, to embed Standards of Math Practice in specific math benchmarks. Math and science teachers will be learn to differentiate instruction at national and regional conferences relevant to their subject areas. Then Resource Teachers will further customize training via the district’s subscription to the online professional development tool PD360.

A special part of staff development will be technology integration across the curriculum. Teachers need to be comfortable demonstrating technology and integrating these tools into lessons. The Polk district has a network of technology coaches made up of teachers with voluntary, advanced technology training through the Florida Center for Instructional Technology’s Florida Digital Educator Program. The Technology Coaching Program provides ongoing professional development at the school on digital devices and resources to promote technology integration in the classroom. These Teaching and Learning Institutes bring educators together for four days, in a workshops environment, where they learn, share ideas, explore engaging teaching practices, and create projects using digital tools.

At each **EduSTEM** school, technology coaches will train others after participating in the institutes. **EduSTEM** will train five technology coaches at each magnet by the end of the Year 3. Technology coaches will continue development through district training and serve as peer coaches, mentors and technology trainers at each site. A site-based coach may offer training for teachers to use interactive whiteboard lessons with SMART Notebook Software. **EduSTEM** will add special technologies, such as use of scientific probes offered by the Vernier probeware vendor, and Apple Education training with personal digital devices.

(a) *Plan of Operation*

(2)(i) The effectiveness of its management plan to ensure proper and efficient administration of the project

Project Management

A **Project Director** assigned at 100% of his time will supervise *EduSTEM*. There will be two fulltime professional specialists, detailed below, and one at 35% of her time assisting in the Magnet Office. Each school will house a 100% grant-funded Resource Teacher to guide implementation of the magnet themes. This will be a daily liaison for the local administrator, smoothing processes and new methodologies incurred by the heightened level of site activity. An organization chart showing *EduSTEM* positions appears in Section (2)(iii) below.

The Project Director will oversee the grant and assure that the *EduSTEM* school transformations are fully implemented with fidelity. He will oversee enrollments to assure that minority isolation is reduced or eliminated at each targeted site, both magnets and feeders. He also will oversee the enrollment processes to assure smooth enrollment of students in the 2,782 magnet seats (2,218 new) in *EduSTEM*. He will monitor the academic achievement at each of the project sites to assure that high-yield systemic reform strategies are resulting in increased student achievements for all sub-groups. He will maintain contact with the external evaluators to incorporate continuous feedback that alerts project management to possible problems, allows for timely action, and assures that goals are fully and timely implemented.

A grant **clerk** will support the director with clerical duties related to documenting expenditures, procurements, day-to-day communications, scheduling and preparing for appointments and travel, and other office management. The Project Director will use a contracted bookkeeper to keep timely financial records and reports.

The curriculum Senior Coordinator and the STEM Resource Teacher from the Magnet Office will work at the four ***EduSTEM*** schools. The Magnet/Choice Senior Coordinator, 35% grant-funded, will aid with student selection and project accountability in the Magnet Office.

The **Senior Coordinator for Professional Development** will help the schools organize the systemic reform, and assure that teachers are not only attending but implementing the International Baccalaureate and STEM training. She will organize curriculum development and professional development, with attention to the progress toward the Primary Years and Middle Years Programmes authorizations. She will work with the curriculum Resource Teacher at each school. The Senior Coordinator for Professional Development will assist consultants with change management to include each school’s vision and action plan to provide a comprehensive strategy to identify priorities, broken into logical steps of implementation.

The **STEMSTEAM Resource Teacher** will work with the four schools to infuse STEM components throughout the curriculum. She will coach the schools in reforming instruction so that lessons integrate content through tangible projects that students can relate to their homes and communities. During Year 1, she will help schools identify opportunities for integration via rigorous, vertical and horizontal curriculum that spirals throughout the grade levels. In Year 2, she will focus on incorporating highly effective teaching strategies. In Year 3, she will see that the teacher-created units feature hands-on, real-world projects which are authentically assessed.

The Project Director will hire the STEM/STEAM Resource Teacher under Polk’s “Magnet Teacher Resource Specialist/Trainer” job description, herein called “Resource Teacher.” It requires, at minimum, state-certified teachers who have shown expertise in their fields sufficient to assume professional development roles for other teachers. The position is paid according to the district’s teacher salary schedule, with a supplement to work an 8-hour day

rather than 7.75 hours, and a 20% increase to work 12 months rather than 10. The district has excellent candidates from schools serving as STEM demonstration sites.

Teacher Mentors

Lawton Chiles Middle Academy is the *EduSTEM* demonstration site for both International Baccalaureate and STEM programs. Its teachers will be trainers as well as models. Lawton Chiles is an “A” magnet school located in Lakeland near proposed magnets Lincoln Avenue Academy and Winston Academy of Engineering. This demonstration site was authorized as an International Baccalaureate Middle Years Programme school with a litany of commendations and zero “matters to be addressed.” This high-performing school has teachers with both elementary and middle school backgrounds who are pledged to mentor others. The “Fab Lab” teacher (this is defined later) has a degree in engineering and will help with digitally-guided fabrication at Dundee Ridge and with student discovery labs at Winston and Lincoln. The Middle Years IB coordinator at Lawton Chiles presently models authorized IB best practices at two other Middle Years IB schools. She also facilitates and counsels through their international authorization and conducted state-level training.

<p>(ii) The effectiveness of its plan to attain specific outcomes that— (A) Will accomplish the purposes of the program; (B) Are attainable within the project period; (C) Are measurable and quantifiable; and (D) For multi-year projects, can be used to determine the project’s progress in meeting its intended outcomes</p>
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Winston Academy of Engineering and Dundee Ridge Academy will open in August, 2014, serving grades K-5 and grades K-8, respectively. Lincoln Avenue Academy will revise its curriculum as of January, 2014. Jewett School of the Arts will revise its curriculum, and convert from a choice school to a magnet school, as of January, 2014.

Measurable goals, objectives and benchmarks appear below for each **EduSTEM** school. Curriculum defined by the Common Core State Standards is approved by the State Board of Education to provide uniform, standardized expectations for student achievement. These standards are more rigorous and challenging than those they replace. They have higher levels of cognitive complexity. They emphasize problem solving, application, and critical thinking. Florida is working on exams to measure Common Core State Standards; the multi-state PARCC will replace FCAT 2.0. These measures will yield data on students' mastery of standards, as well as provide indicators of yearly gains in specific areas.

Project Outcomes

EduSTEM has six purposes aligned with the Magnet Schools Assistance Program. A set of objectives and performance measures follows each purpose below.

Purpose 1: The elimination, reduction, or prevention of minority group isolation in elementary and secondary schools with substantial portions of minority students.

The four proposed magnet schools will reduce minority group isolation by decreasing the percentage of one or more groups of minority students (Black, Hispanic) and increasing the percentage of white students as a result of **EduSTEM**. Every student enrolled in an **EduSTEM** magnet will participate in the academic program.

Objective 1. **EduSTEM** will reduce minority group isolation at the proposed magnet schools (*addressing MSAP Performance Measure a.*).

Performance Measure 1.1-1.5: By October 1 of each project year, EduSTEM will attain approved enrollment targets for each racial group (see **Table 3: Enrollment Data-Magnet Schools**) by reducing minority group isolation (Black, Hispanic) at the three new and one revised magnet schools (using 2012-13 as the baseline) by at least 2% in Year 1, 4% in Year 2, and 6%

in Year 3, or until the groups match the same-year district average. Based on U.S. Department of Education’s interim, final rule of MSAP eligibility, the isolated minority group in each school was identified by comparing the percentage of their membership in each school to the districtwide average for the group.

Furthermore, using 2012-2013 as baseline, the magnets will prevent minority group isolation at feeder schools with student representation above the districtwide average. This will occur by increasing the number of under-represented students at these magnets to align them with district averages while decreasing minority group isolation at the feeder. Minority group isolation at feeders for these magnets with students represented above the district wide average will be reduced 2 percentage points annually until the feeder has aligned to districtwide averages.

The schools are: **1.1** Winston Academy of Engineering Academy; **1.2** Dundee Ridge Academy; **1.3** Engineering Jewett School of the Arts; and **1.4** Lincoln Avenue Academy. Their 2012-13 enrollments are:

School	Amer. Indian/ Nat. Alaskan	Asian	Black or African-Amer.	Hispanic/ Latino	Nat. Hawaiian or Other	White	Two or more races	Total Students Enrolled
Winston	█	█	35.3%	32.2%	█	29.0%	█	513
Dundee Ridge	█	█	28.3%	48.3%	█	18.4%	█	988
Jewett Arts	█	█	28.3%	15.1%	█	50.1%	█	711
Lincoln Avenue	█	11.3%	18.4%	10.8%	█	56.3%	█	569

Their baseline target group enrollments, compared to the districtwide racial averages, are:

Magnet	Feeder	Group Isolated	District Avg. for Group	2013 School Rate for Group	Projected Ending Rate
Winston		Black	20.7%	35.3%	29.1%
Dundee Ridge		Hispanic	29.5%	48.3%	38.8%
Jewett Arts	Wahneta	Hispanic	29.5%	80.8%	76.8%
	Pinewood	Hispanic	29.5%	33.3%	29.5%
	Westwood	Hispanic	29.5%	40.0%	36.0%
	LA-Addair	Hispanic	29.5%	31.6%	29.5%
Lincoln Avenue	Jesse Keen	Hispanic	29.5%	56.5%	50.5%
	Sleepy Hill	Hispanic	29.5%	33.5%	29.5%
	Oscar Pope	Hispanic	29.5%	33.4%	29.5%

The overall Magnet School 2015-16 (project Year 3) projections are:

School	Amer. Indian/ Nat. Alaskan	Asian	Black or African-Amer.	Hispanic/ Latino	Nat. Hawaiian or Other Pacific Is.	White	Two or more races	Total Students
Winston Academy	■	■	29.1%	30.5%	■	36.8%	■	554
Dundee Ridge	■	■	25.7	38.8	■	24.9	■	926
Jewett Arts	■	■	27.2%	21.2%	■	44.4%	5.2%	728
Lincoln	■	7.5%	22.8%	18.3%	■	50.9%	■	570

Performance Measure 1.5 -1.7 For each project year, each magnet school will applications sufficient to allow the schools to reach their group targets over time. The following measures list the number of applications to be accrued each year for each school. **1.5** For Year 1, Dundee Ridge, 500; Winston Academy, 300 (first recruitment year for both); Jewett Academy, 250, Lincoln Avenue, 175 (conversion from a choice school, and revised magnet, respectively). **1.6** For Year 2 (full implementation), Dundee Ridge, 175, Winston Academy, 125; Jewett Arts, 135; Lincoln Avenue, 125. **1.7** For Year 3, Dundee Ridge, 150; Winston Academy, 125; Jewett Arts, 135; Lincoln Avenue, 125.

Purpose 2: To develop and implement magnet school projects that will assist local education agencies achieve systemic reforms, and provide all students the environment to meet challenging State academic content standards and student academic standards

The Magnet Office resource staff will facilitate and support systemic reforms, magnet themes and rigorous curricula for all students at *EduSTEM* schools.

Objective 2: All students will receive instruction that includes their school's systemic reforms and magnet themes in units and courses aligned with state standards.

Performance Measures: **2.1** By October 15 of each project year, each magnet school's School Improvement Plan will be revised to include objectives and activities that support: ► the adoption of high standards for all students and ► specific systemic reforms (e.g., Common Core Standards, Inquiry, Project-Based Learning); and how they are coordinated with MSAP activities. Success will be determined through inspection of each school's plan. Implementation success will be measured by performance measure 3.1.

Purpose 3: Development and design of innovative educational methods and practices that promote diversity and increase choices in public elementary and secondary schools

Magnet theme development and implementation and adoption of systemic reforms will increase diversity and choice because the curricula are distinctive (not offered at other schools at the same grade levels) and innovative (combine systemic reforms and unique magnet themes).

Objective 3. All students at each ***EduSTEM*** school will receive explicit instruction in the designated magnet theme, such as laboratory exercises and application projects.

Performance Measures: **3.1** By the end of each project year, all students, at all grade levels, in all ***EduSTEM*** schools, will receive magnet theme instruction coordinated with or including systemic reforms for at least 3 (Year 1), 6 (Year 2) and 10 (Year 3) hours per week. Winston Academy and Dundee Ridge Academy will be in planning in Year 1. Success will be determined through unit plan analysis and confirmed with surveys, interviews, and walkthroughs. Units and lessons produced as a result of this program will be reviewed by peers.

Program Purpose 4: Courses of instruction in *EduSTEM* schools will substantially strengthen the knowledge of academic subjects and the attainment of tangible and marketable vocational, technological and professional skills of their students.

The U.S. Department of Education has approved Florida's ESEA Flexibility Request (NCLB Waiver). Florida now uses Annual Measurable Objectives, an annual set of calculations based on the percentage of all students or subgroups of students who reach proficiency in a subject. The calculated target shows whether the school/subgroup is on track to reduce its percent of non-proficient students by half by 2016-17. The baseline year is 2010-11. Essentially, Annual Measurable Objectives are the percentages of students who are expected to be proficient for a given year. There are target rates for each school for its total population and each subgroup, for each subject area tested. The subgroups are Black/African-American, Hispanic, Asian, White, American Indian, Economically Disadvantaged, Students with

Disabilities, and English Language Learners.

The subjects tested are Reading and Mathematics. Annual Measurable Objectives are based on the Florida Comprehensive Assessment Test (FCAT 2.0). The new objectives are not calculated for writing or science. Student achievement in those areas is described annually by the percentage of students reaching “proficiency” (“satisfactory” for writing, or “at or above grade level” in science) for all students and subgroups.

If an Annual Measurable Objective is not attained, a subgroup or a school can still meet the annual improvement target by attaining the “Safe Harbor” criterion: a 10% reduction in the percent of non-proficient students when comparing current and prior year proficiency percentages.¹² Schools and subgroups that attain 95% proficient or higher meet the state's high performing target and therefore attain its Annual Measureable Objective without the requirement for annual improvement.

Objective 4. Each year, each magnet school will attain its Annual Measurable Objectives (targets) or Safe Harbor criteria for all students and for each student subgroup, as defined by Florida's ESEA Flexibility Request. Each year more students will reach proficiency in reading, writing, math and science.

This objective addresses MSAP (U.S. Department of Education) Performance Measures (b and c): The percentage of students from major racial and ethnic groups in magnet schools receiving assistance who score proficient or above on state assessments in reading/language arts and mathematics.

Performance Measures: **4.1** By the end of each school year, each magnet school will attain its reading targets or Safe Harbor criteria for its total population and for each subgroup.

¹² Schools can meet the above criteria only if 95% of students in a group are tested.

4.2 By the end of each school year, each magnet school will attain its mathematics targets or Safe Harbor criteria for its total population and for each subgroup of students.

4.3-4.5 By the end of each school year, the percentage of students from major racial and ethnic subgroups in *EduSTEM* schools who score proficient or above on the FCAT will increase compared with the previous year for **4.3** reading; **4.4** mathematics; and **4.5** writing.

4.6 By the end of each school year, for each *EduSTEM* school, the percentage of students who score on grade level or above on FCAT 2.0 science will increase compared with the previous year.

4.7 By the end of the project period, as a result of the implementation of theme curricula, 75% of students at each magnet school will develop mastery of that curriculum, as determined by methods such as alternative performance measures including portfolios, teacher checklists, etc.

Purpose 5: Improvement of the capacity of LEAs, including through professional development, to continue operating magnet schools at high performance levels after Federal funding is terminated.

Objective 5. Provide professional development for *EduSTEM* teachers related to systemic reforms and magnet theme development and implementation.

Performance Measures 5: By the end of each project year, *EduSTEM* teachers will receive at least 60 hours of professional development (e.g., workshops, courses, coaching) in the following areas: **5.1** (20 hours) the development and implementation of the systemic reforms listed in the school improvement plan; **5.2** (10 hours) development and implementation of systemic reforms or instruction leading to the magnet theme; and **5.3** (30 hours) directly related to the implementation of the magnet theme.

Other performance measures related to building capacity are 2.1, development and

implementation of systemic reforms; and 3.1, magnet theme units and courses.

Purpose 6: Ensuring that all students enrolled in the magnet school programs have equitable access to high quality education that will enable the students to succeed academically and continue with postsecondary education or productive employment.

Monitoring is important to ensure that all students enrolled in the magnet schools have equitable access to high quality education. The Project Director and each magnet school's principal will monitor class-by-class enrollments, and the evaluator will report each year on Performance measure 6.1. As with all performance measures, schools not attaining the measure will take corrective action approved by project and district staff.

Objective 6a: All students enrolled in the magnet schools will have equitable access to high quality education.

6.1 By the end each project year, for each magnet school, at least 75% (yr. 1), 85% (yr. 2) and 95% (yr. 3) of classes (elementary) and STEM classes (secondary), will reflect their grade's enrollment for each racial/ethnic group and males and females by ± 15 percentage points.

In addition, performance measures 2.1 and 3.1 are related to providing all students the environment to meet challenging state standards including Common Core State Standards.

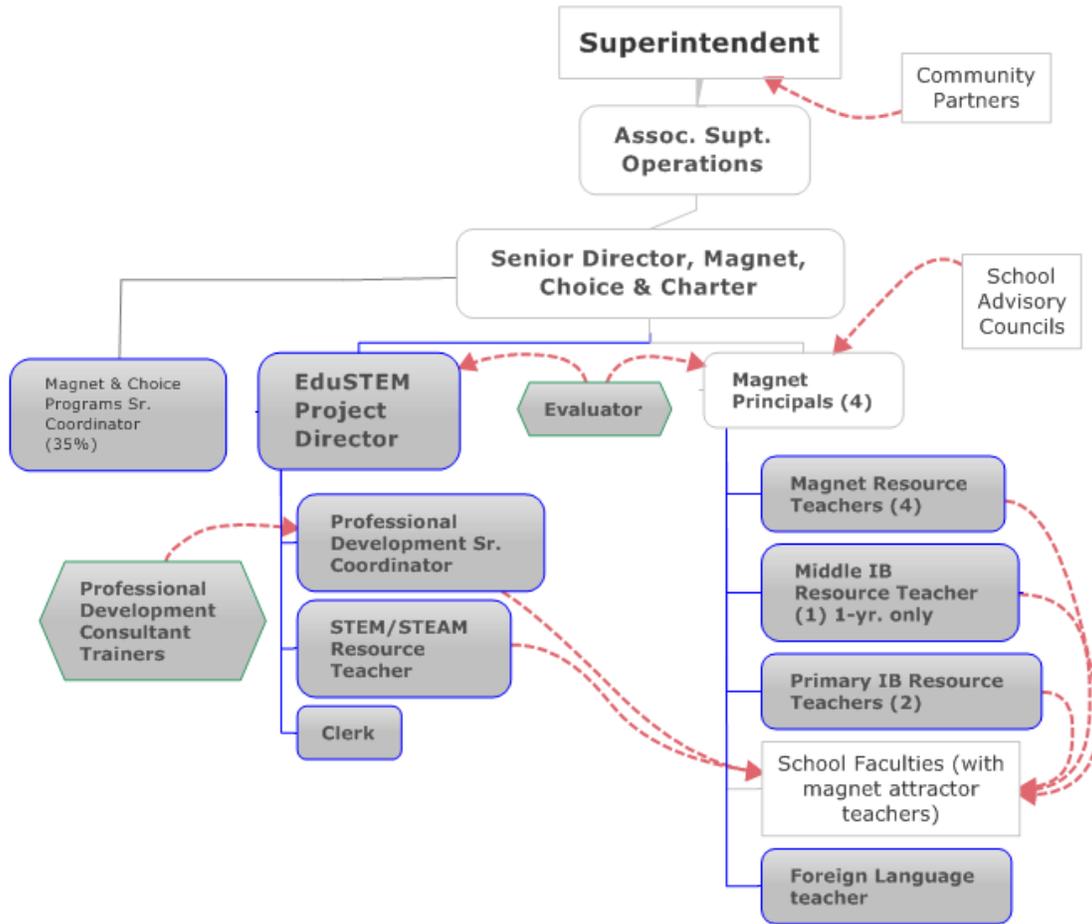
Objective 6b: There will be an increase in parent participation at each magnet school. Parent involvement also promotes equitable access to high quality education for all students.

6.2 By the end each project year, for each school, there will be an increase (compared with the previous year) in the numbers of parents who participate in school activities.

(iii) The effectiveness of its plan for utilizing its resources and personnel to achieve the objectives of the project, including how well it utilizes key personnel to complete tasks and achieve the objectives of the project.

This chart shows *EduSTEM*-funded positions in shaded boxes. All job descriptions

appear in the attachments. Dotted lines denote stakeholder and other expert input in addition to the *EduSTEM* chain of accountability.



Highlights of the staff responsibilities are listed on the following page.

Resumes in the attachments show that many of these practitioners have designed instructional strategies to meet specialized student needs. Several were involved in Polk’s early actions to desegregate schools. Their experiences show continuous efforts and a sophisticated understanding of the complexities of implementing an effective desegregation plan.

District

Position and Responsibilities

- **Project Director**
 - monitor and direct recruitment of students
 - ensure weekly magnet theme instructional time
 - submit Annual Performance Report
- **Professional Development Senior Coordinator**
 - develop professional development for school themes
 - provide support for systemic reforms
 - facilitate implementation of Common Core in Unit development
- **Magnet Resource Teacher (12 months)**
 - assist magnet schools with STEM implementation
 - provide hands on experiences for school based magnet teacher resource specialist
 - produce as an expert in field, content resources for use in STEM daily lessons and unit plans

EduSTEM

School

Position and Responsibilities

- **Magnet Principals**
 - direct implementation of magnet programs
 - work collaboratively with feeder schools, parents and community groups to recruit students
 - provide opportunities for teachers to review student academic progress and adjust curriculum based on student need
- **Magnet Resource Teacher (10 months)**
 - develop and implement recruitment plans
 - plan parent opportunities to be at magnet school
 - collect data on magnet class demographics, amount of training for teachers in magnet and systemic reforms
- **PYP/MYP Coordinators**
 - train staff on International Baccalaureate (IB) Programmes
 - schedule staff for IB trainings
 - complete all IB application forms and paperwork

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Classroom

Position and Responsibilities

- **Magnet Attractor Teachers**
 - provide direct magnet theme instruction daily
 - provide input to grade level and content unit planning meetings
 - model or team teach illustrating STEM or appropriate program content or technology implementation
- **STEM and PYP/MYP trained teachers**
 - work collaboratively by grade level or team to implement magnet program
 - produce magnet units
 - practice methodologies from professional development in systemic reform and magnet themes

Polk County, FL Public Schools

To ensure that the staffs of the new magnet schools are committed to the rigorous training schedule and dedicated to the ideals of the attractor themes, all staff currently employed at Winston Elementary and Dundee Ridge Middle must re-apply if they wish to return as part of **EduSTEM**. Staff including administrators must sign letters of commitment that specify willingness to participate in summer, after-school and weekend training; support the tenets of the STEM and IB themes; and extra work to create units of lessons to match the stated curriculum. A sample Letter of Commitment is attached.

The Magnet Director and Senior Director will have administrators in place in time to begin hiring teachers in July of 2014. The **EduSTEM** Project Director is in place now, and the two Senior Coordinators (one at 35%) will likely come from an existing specialist and an existing Resource Teacher. Hiring will be for

- Winston and Dundee Ridge principals (locally funded)
- Primary Years IB and Middle Years IB assistant principals (locally funded and sustained)
- Middle Years IB Resource Teacher (grant-funded two of the three years of **EduSTEM**, then sustained by the district)
- two Primary Years IB Resource Teachers (grant-funded, sustained by Polk after 2016)
- four school-based curriculum Resource Teachers (grant-funded, one at each magnet, phased out after curriculum is in place)
- the Magnet Office-based STEM Resource Teacher (grant-funded, phased out after curriculum is in place).

Once the signed letters of commitment are executed, **EduSTEM** will begin training teachers in International Baccalaureate level 1 and host tours at the demonstration site. The

initial core of teachers can begin immediately at unit and program development.

EduSTEM administrators and Resource Teachers will lead professional development, meet with teachers weekly in professional learning communities, and use assessment data to assist teachers in planning instruction, enrichment and interventions. The Resource Teachers will be compile and collect all information related *EduSTEM*, theme-related school and parental involvement activities, and curriculum and professional development for all staff.

These Middle Years IB and Primary Years IB Resource Teachers will have special expertise and assist in the development and implementation of the recruiting plan for the school in addition to being responsible for leading teachers in curriculum development and monitoring magnet activities at the schools. They will work directly with teachers every day.

Each school's administrative team is responsible for supervising all staff, implementing all aspects of the school-wide magnet program, and for recruiting highly qualified staff. Administrators will attend training with teachers to for the instructional leadership expertise to move the school toward meeting all project objectives, and will support the train-the-trainer teacher experts. The principal is responsible for teachers, counselors and special activities to improve achievement and will monitor the school's progress toward meeting annual magnet goal and objectives. The principal will implement on-site strategies to meet *EduSTEM* objectives each year. The Polk district is opening additional high school International Baccalaureate seats by 2017 to accommodate students matriculating from *EduSTEM*.

Polk's high school career academies are testament to our curriculum development capacity, drawing heavily on local industry. Partnerships such as Lakeland Electric and its power plant worker program weave curriculum benchmarks for different subjects into applied

studies. The district has engaged all five local hospitals in activities for medical academies, NASA speakers at the Aerospace Academy, and many other interactions for students.

Lawton Chiles Middle Academy Demonstration Site

Models and Mentors for Dundee Ridge Academy - The teachers at Lawton Chiles Middle Academy in Lakeland have worked closely with two other middle schools (in Bartow and Winter Haven) seeking Middle Years IB international authorization. Lawton Chiles teachers developed units using the Middle Years IB template, focused on the underlying pedagogy. **EduSTEM** will kick-start the Middle Years IB program at Dundee Ridge by allowing Lawton Chiles teachers to share their effective units already in place (Middle Years IB units are attached) and help Dundee Ridge teachers adapt them to their unique student needs. The Lawton Chiles teachers are committed to a mentor Dundee Ridge teachers for at least 10 hours per year, per mentor. Lawton Chiles teachers agreed to make site visits to Dundee Ridge during Year 1 to help integrate the agricultural lab and/or graphic arts into the academic offerings. A train-the-trainer plan using Lawton Chiles teachers as mentors appears in the attachments.

The chart below describes the responsibilities of the subject-area mentor.

Mentor Responsibilities	Benefit to the Mentee
All-Day Classroom Demonstration Visit #1 Intro to MYP, Sept	Create resource documents including the MYP subject guide and reference material, text & Internet resources. Add grade level specifics to resource documents as appropriate for 2 nd & 3 rd teachers.
All-Day Classroom Demonstration Visit #2 – Key Tenets of MYP (Nov./Dec.)	Select a day when these concepts will be modeled. Create subject/grade level resource documents. Provide copies of relevant lesson and unit plans, rubrics, etc. Add specifics to resource documents as appropriate for 2 nd & 3 rd teachers.

Visit #2 Implementation Project	Mentor and mentee collaborate to identify a lesson for the to to infuse at least a key component of MYP. The mentee will provides this lesson to the mentor before the next visit so the mentor can prepare constructive feedback to the mentee during the visit.
All-Day Classroom Demonstration Visit #3– Systemic Reform (March)	Select a day when systemic reform concepts will be modeled. Create subject/grade level resource documents. Provide copies of lesson and unit plans, rubrics related to the systemic reforms. Add grade level specifics to resource documents as appropriate for 2 nd & 3 rd teachers.
Visit #3 Implementation Project	Identify a lesson that the mentee will teach to infuse at least one systemic reform. The mentee provides this lesson to the mentor before the next visit so the mentor can prepare feedback for the visit.
All-Day Classroom Demonstration Visit #4– Common Core State Standards (June)	Select a day when the Common Core Standards are integrated into the lesson to be modeled. Create subject/grade level resource documents. Provide copies of lesson and unit plans, rubrics related to the Common Core State Standards addressed. Add grade level specifics to resource documents as appropriate for 2 nd & 3 rd teachers.
Visit #4 Implementation Project	Identify a lesson that the mentee has planned to teach in order to include the integration of Common Core State Standards. The mentee will provide this lesson to the mentor and the mentor will provide feedback via web conference, email or phone conference.

Articulation with Lincoln Avenue Academy and Winston Academy of Engineering -

Since the students from both Lincoln Avenue Academy and Winston Academy of Engineering will roll up into the Lawton Chiles program, the three schools will articulate the curriculum in

grade-by-grade expectations. *EduSTEM* will fund time for them to spell out:

- what lessons will look like with all of the attractor features of the curriculum.
- focused units of study with the highly effective teaching strategies of the STEM and IB themes, with consistency of message and aligned essential questions, significant concepts, STEM-infused activities, real-world applications, and rigorous formative and summative assessments

(iv) How it will ensure equal access and treatment for eligible project participants who have been traditionally underrepresented in courses or activities offered as part of the magnet school, e.g. women and girls in mathematics, science, or technology courses, and disabled students.

An important aspect of ensuring that all students enrolled in the magnet schools have equitable access to high quality education is to monitor access as defined in Performance Measure 6 above. A plan of academic strategies that ensure representation and academic success for underrepresented participants follows, addressing learner outcomes and specifically meeting the needs of all academic learners through research-based learning models and strategies.

All students enrolled in the magnet schools will have equitable access to high quality education. By the end each project year, for each magnet school, at least 75% (yr. 1), 85% (yr. 2) and 95% (yr. 3) of classes (elementary) and STEM classes (secondary), will reflect their grade's enrollment for each racial/ethnic group and males and females by ± 15 percentage points. To help parents and staff better understand Middle Years IB, Lawton Chiles Middle Academy, the demonstration site, will host tours during the school day, and publish an interactive, web-based tour for parents to view Middle Years IB in action.

Teachers will work together in interdisciplinary teams and across grade levels to assure that parents have adequate knowledge of upcoming projects and the requirements of those

projects. Teachers will use rubrics so parents understand the expectations of each project. Teachers will offer choices to students, as appropriate, to allow students multiple ways to demonstrate mastery of a skill set. This assists with conquering the digital divide, and gives students ways to demonstrate higher order learning in a variety of modes.

Redistricting will cause a drastic demographic shift at Dundee Ridge because most of its students, largely Hispanic and black, will be enrolled in classes closer to their homes. The new Dundee Ridge Academy will attract and serve a population that reflects the demographics of the district as a whole. In order to accomplish this lofty goal, the program and attractors must appeal to a broad spectrum of students.

Middle Years IB Student Ambassadors for Dundee Ridge Academy will be students in grade 8 who apply from interest and have parental permission. The Resource Teacher and Middle Years IB coordinator will work with student ambassadors during and after school. This cross-section of students will receive training in leadership skills, team building, social etiquette, public speaking, and peer mediation. They will accompany visitors on tours to show potential students and parents around school and to explain its innovative learning environment. They will serve as liaisons between the school and the community and will rotate in groups to greet parents and guests at evening meetings, Open House, or student orientation visits.

Giving back to the community is embedded in the local curricula for International Baccalaureate studies. Each grade level will sponsor at least one, local, service learning project such as growing and distributing fresh vegetables to needy families, designing and painting and distributing rain barrels for water conservation, tutoring students in younger grades, or teaching community members to use computers. Every student will participate in planning, researching and implementing service learning projects.

Polk schools commissioned a study by the Education Development Center, Inc., of Newton, MA, a subgroup of the Urban Collaborative. The resulting March 2010 report is titled, “A Review of Programs and Services to English Language Learners in the Polk County Public Schools.” The district sought guidance in the wake of parent concerns in the Hispanic community and chose a proactive approach to working with the Florida branch of the League of United Latin American Citizens. This group negotiated Florida’s requirement for all teachers with English language learners in their classrooms to complete a prescribed number of hours of ESOL training for ESOL endorsements on their permanent records. Recently the related training requirements have been ramped up for school administrators as well. The Urban Collaborative report makes specific recommendations to improve family outreach as well as classroom practices to help English Language Learners—mostly Hispanic in Polk—to master academic standards, and the Polk district has directed the schools to institute action plans to follow the recommendations. *EduSTEM* is part of the response from the Office of Magnet, Choice and Charter Schools.

(v) The effectiveness of its plan to recruit students from different social, economic, ethnic, and racial backgrounds into the magnet schools.

Magnet and choice schools in Polk are open to all students. Representatives from high performing magnet schools visit the Title I schools to market their magnet and choice programs with marketing materials for parents and students. The Magnet Office ensures that recruitment materials are clear for parents of students with disabilities while outlining a full range of choices that are available. Polk County actively recruits to guarantee that every magnet school is serving the broadest population of these students possible.

Prior to the student selection, the Magnet Office targets recruitment by identifying underrepresented groups in the applicant pool or magnet school. It uses these strategies:

- Presentations to parent groups; e.g.. local churches, pre-school moms' meetings
- Publication of print media in multiple languages to hand out at presentations or to leave for parents to pick up in public places; markets, community centers, and churches
- Outreach through the district's ESOL Department, Magnet Office and local school staff including home visits with translators to overcome language barriers
- Individual phone calls to parents to discuss magnet options and application opportunities
- Organization of feeder school visits utilizing students in presentations. For example, an eighth grade jazz band from Jewett School of the Arts goes to Pinewood Elementary to play a mini-concert and discuss experiences at their school

Dundee Ridge Academy and Winston Academy of Engineering will recruit students for 1,480 new magnet seats. They will work from priorities to recruit students from different social, economic, ethnic, and racial backgrounds. This will be accomplished by hosting parent nights with translators, and school visits during the day for parents to observe school activities.

Media – Polk advertises magnet application information through local papers, news programs, cable TV public service channels, and on our web pages. The Internet address is printed on all publications and online at www.polk-fl.net keyword “school choice.” The local cable television network on channel 14, Polk Government Television (PGTV), plays Magnet Office recruitment videos during varying hours of the day over several months before and during application periods. Staff will use Facebook and Twitter as well to market magnet schools and answer questions.

Flyers and Brochures - Every student enrolled in a Polk County school receives a

detailed information sheet about school choices sent home via report cards. More than 90,000 flyers are distributed this way. The flyers provide an overview of choice programs and information on how to apply in English, Spanish, and Haitian Creole. The magnet schools print 16,000 brochures annually for recruitment in the community. Brochures are placed at schools in predominantly minority neighborhoods to encourage nonwhite students to apply.

Printed Materials – The Magnet Office prints marketing materials annually in Spanish and Haitian Creole to tell the focus and culture of each magnet. Chambers of commerce, local Realtor groups and other public service agents distribute Parent Resource Guides.

School Marketing Videos - Each magnet school has a marketing video. Each video is 15-20 minutes long and gives students insight to the focus and culture of that specific school. Students may view them on the local cable network as they are played or online at <http://www.polk-fl.net/districtinfo/departments/schoolbased/schoolchoice/videos.htm>.

Open House – Each magnet will publicize and host open house events for all. The marketing options listed above provide a macro and micro approach to informing parents. Macro-marketing, through the use of local newspapers, news media, and cable networks, provides the recruitment information to the entire district. The micro-marketing, individual school open houses and school tours provide a more individualized and personal approach to informing parents of choice options. The overall intent is to target each household in the district and provide information on public school choice options available in Polk County.

Recruitment of Diverse Students – With assistance of the Office of Magnet, Choice and Charter Schools, each magnet school will market beyond the traditional strategies of brochures and videos for informing parents about educational programs and enrollment procedures for each magnet site. We will have Spanish translators available at each event and Haitian Creole

translators available upon request.

This project will provide parent access to computer labs within each of the four magnet zones whose residents may apply to the magnets in their zone. Each school staff using the lab for recruitment and family events can use the included computer software to translate various documents and school communications. These labs will be the epicenter for family-friendly outreach for events such as immunization fairs for incoming kindergartners, homework help workshops and math manipulatives for families, parent conferences in “neutral” or neighborhood settings, engineering demonstrations, workplace volunteer recruitment with cooperation from local employers, exhibits, help with resume writing and job applications for parents, and other Internet access and uses recommended by School Advisory Committees and by students.

The district is promoting “transition” projects and *EduSTEM* will expand Lincoln Avenue Academy’s practice of inviting Head Start children from the neighborhood to a four-week session of daily, one-hour classes called “Bridge to Kindergarten.” Besides offering a service to the community, this practice has proven an effective recruitment tool, as an increasing number of Head Start parents are applying to have their children attend Lincoln. Another example is “Welcome to Our World” Visitors Day, modeled after Epcot exhibits at Walt Disney World. Publicity will include distribution at churches, Health Department clinics, laundromats, adult education centers, through employers, and via the district’s Farmworkers Program. The day will feature student presentations on biodiversity, business partners from the Mosaic Company with a soil testing mobile lab, Florida Fish and Game Department officials with live animals, and observation learning activities. Potential students and their parents will leave with a true understanding of the program as well as animal tracks molded in plaster, a plant collection, and color photo of the student with a live reptile.

Diversity Management Goals in the District Strategic Plan¹³

District Strategic Plan Goals	Related Diversity Management Objectives
<p>SP Strategy 1: We will ensure each student meets his/her academic and personal goals</p>	<p>Ensure that proactive strategies are implemented to detect and eliminate any systemic barriers to minority students reaching his/her academic and personal goals.</p>
<p>SP Strategy 2: We will ensure that our instruction and curriculum meet the educational needs of each student.</p>	<p>Initiate and implement innovative activities that make a difference in learning, diversity, multicultural education, and the unique contributions of minority history.</p>
<p>SP Strategy 3: We will establish a learning environment that ensures the academic and personal success of all students</p>	<p>Promote initiatives that increase multicultural cooperation within the schools and community.</p>

(b) Quality of Personnel

(i) The project director (if one is used) is qualified to manage the project.

Resumes are attached for all of the following.

Project Director Brian Warren has managed more than \$14 million in state choice and federal grant projects since his appointment as Magnet Schools Director in 2010. He will direct ***EduSTEM*** implementation, reporting to the senior director of Magnet, Choice and Charter

¹³ <http://www.polk-fl.net/districtinfo/documents/strategicplan2011-2014.pdf>

Schools. Mr. Warren will work 100% on this project and be paid by the grant, managing the budget, providing leadership to project schools, overseeing training for school staffs and teacher resource trainers, interpreting federal guidelines, and managing contracts and all reports. He will hire grant-funded personnel (together with principals for school-based positions), approve expenditures, and serve as MSAP liaison.

Mr. Warren holds a B.A. from Southeastern College and a master's degree in educational leadership From Nova Southeastern University. He has completed Category One, Two and Three International Baccalaureate Head of School training and has led schools in professional development and implementation of Science Technology Engineering and Mathematics.

As Polk's resident, expert, desegregation analyst, for more than seven years he has handled implementation, data collection, evaluation, and reporting on choice initiatives in this large district. This has included oversight for rigorous and accurate student recruitment and selection for eight magnet schools under three, successive systems (originally by black/nonblack waiting lists, then by paired enrollments, and now by replication of the Berkley Unified School District Model, described in the narrative for Priority 3). He has transitioned magnet applications to a paperless process. He is a member of Magnet Schools of American and has presented at national conferences and conducted sessions at state meetings on defining choice, student recruitment and student achievement.

Carolyn Bridges, senior director of Magnet, Choice and Charter Schools, oversees programs in 17 magnet and choice schools and is district liaison with 32 charter schools. She will devote 20% of her time to this project. She will remain locally funded.

Mrs. Bridges sat on the biracial community desegregation committee that crafted our first magnet schools in 1991 leading to Polk's unitary status. She is a former middle school Teacher

of the Year and career center curriculum specialist who holds a B.S. in elementary education from Southeastern University and a master's degree in educational leadership from the University of South Florida. She was an assistant principal and Southeastern University adjunct instructor. Under her leadership, Polk County was awarded the National Association of Charter School Authorizers' 2009 Award of Excellence. She is the president of the Florida Association of Charter School Authorizers. Mrs. Bridges has completed a variety of International Baccalaureate training including head of schools; areas of interaction; and integration of technology. Her administrative experience includes successful management of numerous government grants, and she is an expert in all aspects of accountability and audit procedures, human resource management, resource deployment, contract management, legal and ethical issues, public relations, and all levels of protocols.

(ii) Other key personnel are qualified to manage the project.

Project evaluator **David Kikoler** is president of American Education Solutions, Inc. a New York-based consulting firm that works with districts on magnet school programs throughout the eastern United States. He and Vice-President **Elaine Rosales** both were educators for more than 35 years and have magnet school experience for 25 years. Their federal programs experience includes the Magnet Schools Assistance Program, Voluntary Public School Choice, Smaller Learning Communities, 21st Century Community Learning Centers, National Endowment for the Humanities, Even Start, Title VII Bilingual Programs, Magnet Innovative Program, Safe and Drug-Free Schools and Communities Program, Jacob Javits Gifted and Talented Program, Teacher Opportunity Corps, Teachers' Center, and Child Welfare Development Program. Their grant-funded contract includes technical assistance in addition to formal evaluation and reporting. .

Kikoler’s firm has evaluated 51 Magnet Schools Assistance Program grants in 18 years. Partnering with UCLA’s National Center for Research on Evaluation, Standards, and Student Testing on survey development and analysis, and test score analysis, the evaluator’s site visit team includes Dr. Gladys Pack, Dr. Donna Elam, Ms. Joanne Smith, Dr. June Levy, Ms. Janice Sherrill, Dr. Gloria Cole and Mr. Edward Linehan. All have been teachers and administrators with evaluation experience: one assistant superintendent, four magnet school principals, three magnet school directors and one an Equity Assistance Center director.

Pam Henderson, Senior Coordinator of Professional Development, has returned to Polk schools with a law degree and membership in the Florida Bar, after earning her reputation as a “turnaround” principal at a previously low-performing school. She has a B.S. in Speech Correction from Lambuth University in Jackson, Tennessee, M.S. in Educational Leadership from Nova Southeastern University, and J.D. from Florida A & M University College of Law. She holds certifications in Speech Correction, Hearing Impaired, Elementary Education 1-6, School Principal, and endorsement in ESOL. She taught K-12 Exceptional Student Education for 10 years, and grades 4-5 for three years. She spent 13 years in school administration, and has been a magnet school resource teacher for the past two. Mrs. Henderson has recent training in curriculum mapping, International Baccalaureate levels 1 and 2, Learning-Focused Strategies, and brain-based learning. She has worked with nationally known consultants Heidi Hayes Jacobs and Ann Johnson to coordinate professional development for eight magnet schools.

Evelyn Hollen, Principal of Lincoln Avenue Academy for 12 years, has a Bachelor of Science degree in Elementary Education from Southeastern University and a master’s degree in Educational Leadership from the University of South Florida. She led the school to meet 100% of its “adequate yearly progress” goals and earn a school grade of “A” for the past eight years.

Mrs. Hollen was Florida's Innovative Principal and led her school to win an Intel School of Distinction, Scholastic School Finalist for math in 2010, Blue Ribbon School of Distinction 2012 and Five Star Community Involvement School awards 2005-2012. She has seven years' experience teaching in college.

Sharon Neuman, Principal of Lawton Chiles Middle Academy for 19 years, has a Bachelor of Arts in Elementary Education from Southeastern College and masters of Education and Supervision K-12 from Rollins College. Mrs. Neuman implemented the International Baccalaureate Middle Years Programme at Lawton Chiles Middle Academy. Her "A" school led this movement in Polk and will be the demonstration site for the dissemination. In 2011 she was one of three finalists for Principal of the Year by the Florida Council of Instructional Technology Leaders. Hers was the district's first middle school to be accredited by the Southern Association of Colleges and Schools, and she has worked for the district in school administrator training. Her resume lists numerous awards and presentations.

(iii) (5 points) Teachers who will provide instruction in participating magnet schools are qualified to implement the special curriculum of the magnet schools; and

In Polk, because of the rigor of their assignments, magnet school teachers are not assigned, but voluntarily apply to schools that fit their philosophy of education. While there are not specific hiring prerequisites for magnet school teachers, each teacher applicant must sign the Letter of Commitment. (A copy appears in the attachments.) *EduSTEM* teachers will agree, prior to accepting appointments, to participate in at least 60 hours of professional development each year, to help promote the school, and to advance its theme and instructional approaches.

According to the district Certification Office Handbook, "All teachers must hold or be deemed eligible (by a Florida Statement of Status of Eligibility) to hold a valid Florida certificate

for full-time teaching. Teachers must hold certificates covering subject/s required by *Florida Course Code Directory* for their teaching assignments.” In-field certification includes a state-mandated endorsement in teaching English language learners. From year to year the Polk district has had a success rate as high as 97% placing teachers in the fields for which they are certified and who meet the state definition of highly qualified.

EduSTEM is likely to attract teachers with graduate degrees. A program evaluation from the mid-1990s found that teachers who applied at Polk’s magnets were looking for opportunities for creativity, and that they were inspired by curriculum development challenges to seek graduate degrees at about three times the rate of teachers districtwide. This year Polk magnets have 37 National Board Certified Teachers. Two of them helped design *EduSTEM*.

Susan Kallan, specialist for the International Baccalaureate Middle Years Programme, is the MYP Coordinator at Lawton Chiles Middle Academy. She guided her school through the Middle Years IB authorization process and is currently working with two additional middle schools in Polk County to do the same. Mrs. Kallan has completed Middle Years IB training in the areas of head of school/coordinator; areas of interaction; technology integration; and Language Arts. She is a National Board Certified Teacher with a master’s degree in educational leadership and a bachelor’s degree in English education 6-12. She has state endorsements for gifted and ESOL instruction and from the district in technology 1 & 2 certification. She has presented for statewide groups on Core Knowledge, edited textbooks and contributed to a computer software text.

Mijana Lockard, STEM/STEAM Resource Teacher, specializes in technology integration and curriculum development at Lincoln Avenue Academy. She has developed and

implemented integrated STEM curriculum and presented STEM frameworks and units of study at national conferences.

Mrs. Lockard is a National Board Certified Teacher. She is a member of the National Science Teacher Association's steering committee for NSTA's STEM K-12 Expo. She instructs other teachers from throughout the state for the Florida Center for Instructional Technology at the University of South Florida in its Master Digital Educator Program, and nationwide as the Microsoft Innovative Teachers Trainer and Oracle Education Foundation's Project-Based Learning facilitator. She is a certified trainer for development of Common Formative Assessments and Authentic Performance Assessments used within STEM units of study. She has garnered national and state awards from Siemens We Can Change the World, Toshiba Exploravision, Disney Planet Challenge, Microsoft Innovative Teacher, Inspiration Software, Best Buy, and the Disney Teacheriffic Award. She has presented at the state and national venues.

Reginald Patterson, Fab Lab Teacher – Reginald Patterson is the digital design teacher at Lawton Chiles Middle Academy. He holds a Bachelor of Science degree in Mechanical Engineering and has career experience in quality engineering and management. He has done extensive curriculum development and project design to infuse the Fab Lab concepts into the grades 6 - 7 curriculum to prepare the grade 8 for the real-world application that is the Fab Lab.

(iv) The applicant, as part of its nondiscriminatory employment practices, will ensure that its personnel are selected for employment without regard to race, religion, color, national origin, sex, age, or disability.

The four magnet schools proposed in this grant project all have at least one minority administrator. Two of the new magnet schools are led by a minority principal.

In 2008-2009, *The Black Collegian Magazine* recognized the Polk school district as one of the nation's Top 100 Employers for graduates of color. In 2009-2010 *The Black Collegian*

Online: A Career Site for Students of Color cited our district as one of the go-to employers actively recruiting and hiring graduates of color for 2010-2011.

Currently Polk schools are piloting a state research project, “Promoting Diversity in Florida’s Education Workforce,” with the College of Education at the University of South Florida, Lakeland campus. The three-year project is preparing 42, male and minority elementary school teachers, with mentors from both college and the district, during both teacher preparation and early teaching careers. Known as Project PRIDE, its graduates are guaranteed teaching positions in local, high-need schools. These graduates are already influencing their school cultures by helping to promote value for diversity and by demonstrating “effective compassion” together with unwavering expectations for students whose backgrounds mirror their own.

Board Policy 3.001 requires the Polk County School Board to provide all applicants with equal employment opportunities. “The School Board shall maintain a work and educational environment free of discrimination/harassment on the basis of race, color, national origin, sex, religion, marital status, age, disability, or any other basis prohibited by law. This shall apply to all employees, applicants for employment, students, or applicants for admission.” We give equal publicity to the process to register complaints and establish remedies.

Policy is not enough. Polk schools have taken a proactive approach to recruiting and retaining excellent employees who are members of minority demographic groups. In 2006, the district called upon the expertise of The Pascall Company, Inc., a diversity management consultant firm, to develop inclusive marketing and advertising materials targeting diverse populations. Over the past three years the district has placed ads in a variety of publications targeting minority and other critical staff need areas. Publications and online resources advertising our district include *Teachers of Color*, *Saludos.com*, *Equal Employment Opportunity*

Journal. Southern Diversity Schools Campus Publications, Council for Exceptional Children, and Historically Black Colleges and Universities (HBCUs) Online/On Campus Resource Guide.

We also conduct “College Talk” sessions and develop partnerships with historically Black and historically Hispanic colleges and universities throughout the U.S. and Puerto Rico. “College Talks” provide college education students with information about the numerous opportunities with Polk County Schools, certification steps, and steps to apply for employment.

We identify and match minority (if disclosed) certified, qualified, and highly qualified applicants, as defined by the state, with schools that require assistance in creating a more diverse staff. We provide scholarship opportunities to minority group applicants who want teaching jobs but have steps remaining to be certified or hold temporary certification.

Over the past three years, the district has trained 45 recruiters, and 20 are African-American or Hispanic American. We provide a venue for district administrators to conduct webcam interviews with Hispanic and bilingual applicants in Puerto Rico. We participate in the National Alliance of Black School Educators and Florida Fund for Minority Teachers Recruitment and Retention Conferences, and support the American Board of Certification of Teacher Excellence Teach & Inspire Program. The latter recruits, certifies and supports highly effective new teachers of diverse cultural and professional backgrounds in high-need school districts and subject areas.

(c) Quality of Project Design

(i) Promote desegregation, including how each proposed magnet school program will increase interaction among students of different social, economic, ethnic, and racial backgrounds

More than 85% of the students in the Eastern Polk County area surrounding Dundee Ridge Middle School are eligible to receive free or reduced-price lunch. The extreme poverty is

exacerbated by the language barriers that many of the students in this area must overcome. The primary minority population is of Hispanic descent but comes from a wide variety of cultures including South American, Central American, Mexican, Puerto Rican and Cuban.

The Partnership for 21st Century Skills states in the article, “Results that Matter,” that global awareness is critical for success in the community and workplace. Building and expanding global awareness will help students and faculty build across three levels of intercultural awareness: awareness of stereotypes; awareness of cultural traits different from their own; and awareness of another culture from the perspective of an insider. The melting pot of cultures and dialects of the eastern part of the county provide a unique challenge but also an unparalleled opportunity for an IB Middle Years Programme focused on our cosmopolitan community.

Addressing needs of diverse students

EduSTEM will deliberately embed strategies to increase interest, access, and success of diverse populations, especially underrepresented groups, in our rigorous STEM programs.

Heterogeneous Grouping - Building on the 21st century skills, magnet school courses and classroom projects will include small, collaborative group work. Small, collaborative groups bring students from diverse backgrounds together to learn from, communicate with and support each other. Students are grouped by common interest or project topic. Teachers will help students develop trust, understand and accept differences, and cooperate. When students learn to work cooperatively, they will be able to actively participate, express and justify their point of view, explore multiple ideas and learn within a supportive group environment. Heterogeneous grouping will teach students how to learn in a democratic, fair, respectful and equitable environment.

Interdisciplinary common-interest projects/topics - Themes chosen for revised and new magnet programs emphasize interdisciplinary approach to curriculum. This interdisciplinary

approach will be structured to allow students choices of learning projects such as performances, presentations, or showcases. This teaches students they share certain interests with others different from themselves, foster positive attitudes and promote respectful learning environments.

Inclusive Classroom Setting - To reach diverse learners, teachers will create a classroom environment where students engage in learning in a variety of ways and demonstrate their understandings through multiple assessment methods. Furthermore, teachers will use strategies that challenge students to look for multiple solutions or perspectives to a problem or an issue, and create personal links to knowledge, events, and ideas.

The key factors in increasing interactions include a strong, challenging academic program attractive to diverse population, activities structured to promote interaction during the day, effective teacher training in addressing the needs of diverse students, and a school wide behavior support systems developed at each site. For example, Dundee Ridge Middle School has an agricultural lab to prepare students for a high school Agriscience career academy. Dundee Ridge Academy will expand this program through **EduSTEM** for students to learn about all levels of careers in biology, agriscience, engineering, and land management through activities in hydroponics, animal husbandry, and crop improvement.

Multi-Tiered Student Supports

The Polk school district has invested deeply in helping schools level the playing field for students with different requirements of time, modalities, confidence and supports, to overcome disparities and get to the business of mastering both academics and citizenship. Working together with students who present good role models is important for all. **EduSTEM** will attend to keeping students from falling behind. The district thus has expert trainers in Multi-Tiers Student Supports.

To provide support for students striving to meet standards in our rigorous program we will use tiered levels of support through the Multi-Tiered System of Support (MTSS) initiative. MTSS (formerly Problem-Solving/Response to Intervention) is a three-tiered approach to meet individual academic needs. Faculty teams, typically including the guidance counselor and specialists, help teachers figure out why a student is struggling (or misbehaving), brainstorm solutions, and monitor how well their suggestions work. Their goal is to resolve the root of any problem, often involving the family as well as emphasizing consistent reinforcements at school. *EduSTEM* will use the following tiers to determine level of support needed

TIER 1	Students who are successful in meeting standards within regular , core instruction. The school goal is to reach 80% of students, or recognize system problems interfering with this level of school performance.
SUPPORTED TIER 1	Students who are at risk or struggling to meet standards and need additional supports within core, regular instruction to maintain progress. This is an extra step that is unique to our program.
TIER 2	Students who are currently not meeting standards within core, regular instruction and need different ways to learn with specific supports.
TIER 3	Students who need intensive remediation and are currently at least a year behind in meeting standards. This should not exceed 5% of students.

Tier 1 Strategies - Tier 1 strategies are data-driven and include differentiation of instruction based on students’ entry point in the curriculum, progress, learning style, interest or achievement. Weekly teacher teams, called Data Teams, are organized into Professional Learning Communities, continuously monitor progress and adjust activities to assure mastery.

All **EduSTEM** classes will feature heterogeneous, diverse, inclusionary class assignments. In all programs, teachers will use sound practices for linguistically diverse students such as modeling, nonlinguistic representation, use of multiple modalities, visual and graphic organizers, audio representation and use of technology for translation and to aid expression. Furthermore, heterogeneously grouped classes will utilize a variety of differentiated strategies to reach all learners, regardless of their learning style or level of academic performance. Bush (2006) remarks that differentiation of instruction is “difference between proaction and reaction”(Bush, 2006, p. 44). Magnet teachers will use differentiated instruction to reach all students, regardless of their background, interests, abilities or learning needs. With differentiation, the curricular concepts will be the same for all students but the learning paths, products and assessments may differ to challenge each student and provide adequate scaffolds and supports when needed. A sample differentiated lesson plan is attached.

All students will have ongoing access to individualized learning through district software Compass Odyssey and Easy Tech. Compass Odyssey includes language arts, math and science. An individual path is generated by the software based on student assessment. The path may include remediation of prerequisite skills, practice and learning activities on grade level, or enrichment activities. Easy Tech provides pathways for improving technology skills such as keyboarding (particularly relevant since standardized testing is in transition to computer-based) and productivity tools. To assure access to all students, campus computer facilities will be opened before and after school during school days and checkout for equipment will be available at the sites. In addition, during parent information meetings information will be provided on availability of computer and Internet access in public libraries and community centers within school zones. Access to personalized learning opportunities will help students

learn at their pace and strengthen their academic skills.

Supported Tier 1 - The goal of Supported Tier 1 strategies is to prevent student attrition from magnet programs and help them be successful in Tier 1 instruction. This intermediary step will decrease the number of students needing more intensive interventions by proactively addressing student needs. Support may include academics, behavior, social and emotional functioning or attendance. The program will include

a) ongoing monitoring of student progress toward mastery of standards

- During weekly teams meeting teachers will analyze data for students in ST1 to determine progress and adjust instruction. A progress monitoring instrument is attached.
- Data will be shared with others involved in ST1 student success (this may involve special education teachers, support staff, resource teachers etc)
- Ongoing communication with home using student agendas will continuously inform parents of students' progress
- Student data will be discussed with parents during monthly meeting

b) differentiated learning

- Access at school and home to individualized computer based remediation develop by teachers weekly based on data; teacher will use personalization options of Compass Odyssey to create individualized learning paths tailor made for ST1 student
- Modification of homework assignments based on data
- Additional assistance during school day by resource and support staff

c) assistance to families in helping in meeting standards; and

- Connect families to fulfillment of household needs through community resources
- Materials and tools for family assistance (books, technology etc)

- Scheduling of meetings in convenient time to assure parent can attend

d) *team monitoring interventions.*

- Each month the MTSS support team that includes parents, teachers and support staff appropriate to individualized needs of students will analyze and discuss student progress and determine interventions needed

Tier 2 - Interventions will target subjects or other areas unique to the student and include additional one-on-one or small group time. Students will have Extended Learning after-school tutoring. (A monitoring tool is attached.)

Tier 3 - Students in Tier 3 need intensive interventions to succeed. For these students, additional individualized one-on-one interventions will be embedded in all subjects in which students struggle. They will have extra time for instruction as needed in small-group tutoring and other interventions. School teams may seek outside support and testing as needed.

(ii) Improve student academic achievement for all students attending each magnet school program, including the manner and extent to which each magnet school program will increase student academic achievement in the instructional area or areas offered by the school; and

The four ***EduSTEM*** magnet schools will extend standards-based curriculum beyond minimum standards through innovative, challenging, highly motivating activities beyond those in traditional schools. The schools will use interdisciplinary approaches to the innovative themes so that students have multiple paths to learning. ***EduSTEM*** magnets will specialize in drawing achievement in academics and personal development from children who are diverse by previous exposure, level of achievement, cultural backgrounds, and educational ambitions.

EduSTEM students will make daily practice of using technology for exploration and for expression, as they carry out projects both in the community and from across the globe. They

will think of school as a place to work on answering questions, and for discovering what they are curious about. Each themed unit of lessons will tie together specific objectives from all core academic areas, while providing students with competencies in 21st century skills and technology.¹⁴ Science, Technology, Mathematics, and ways to apply Engineering, will permeate the curriculum. In this design, EduSTEM refers to the “engineering design process” as a method of thinking and problem solving that children and adolescents will learn to use as they approach all kinds of studies. (A sample STEM unit and a sample STEAM unit—STEM-infused arts—appear in the attachments.) These features will prepare *EduSTEM* students to feed into existing specialized high school programs across all areas of the large Polk district.

Polk schools have significantly closed achievement gaps between students qualified for free lunch and those who are not. They are not yet to satisfactory levels, and racial gaps remain a challenge. However, district and magnet project administrators examine these scores every semester. In addition to the state achievement tests, Polk schools use Discovery progress monitoring. Professional learning communities, school-by-school, examine the progress of their own students, disaggregated by the same categories that are defined in No Child Left Behind. They examine Discovery Learning scores each nine weeks to adjust instruction and to intervene with any students who are struggling, before they get too far behind.

Through Multi-Tiered Student Supports (formerly Problem Solving/Response to Intervention), we have become sensitized to the needs of children who act out because of problems at home, miss school due to family circumstances, don't get homework done, or even

¹⁴ These skills are implied by the Comprehensive Core State Standards: leadership, cross-cultural social skills, communications, creativity, independent work, interacting effectively, initiative, self direction, adaptability, information literacy, responsibility, accountability, and ethics.

feel bullied or influenced by gangs. The district has restructured alternative education programs in response, added social workers, and studied at length how to succeed at inclusion—for which we now have model schools.

Summary of teaching strategies to improve academic achievement of all students

<i>Strategy</i>	<i>Effect on student achievement</i>
Standards-aligned interdisciplinary units	Align lessons to Comprehensive Core State Standards and interdisciplinary connections to assure that learning is focused on mastery of benchmarks in proper scope and sequence
Quality assessment design	“Backwards map” the units , focusing teaching on differentiated needs of students and assuring all students are mastering standards
Data-Driven Instruction	Monitor student learning and plan instruction to meet learner needs to improve academic performance of each student
21 st century skills (including technology integration)	Develop creativity, problem solving, critical thinking, cross cultural communication, technology skills and self direction, motivate students to learn; increase technology proficiency necessary in 21 st century workplace; enhance self -direction
Research-based instructional strategies	Training and support in pedagogies to help teachers select strategies to meet needs of all learners, maximize impact on learning
Nonfiction writing across curriculum	Implement across curriculum to improve literacy , content area and critical thinking skills

Effective Literacy Education	Used across curriculum, aligned to rigor of the CCSS ELA standards, to assure that students are improving both literacy and content area skills.
Project -Based Learning	Students obtain a deeper knowledge of the concepts; increase retention of concept knowledge; hone organizational and research skills; develop better communication with peers and adults
Inquiry-based learning	Observe, collect, analyze, synthesize information, and draw conclusions to develop deep concept understanding and problem-solving skills
Concept-based learning	Focused on deep understanding of concepts beyond factual knowledge, to improve academics through inquiry and higher-level thinking.
Differentiated Instruction	Multiple options for taking in information and making sense of ideas. Instruction is designed for multiple learning styles and in response to individual student needs increasing performance of all students.
Multi-Tiered Student Supports	Provides individualized strategies and interventions to improve academic performance of students in need.
Responsive , diverse learning environment	Heterogeneous, inclusive learning environment, conscious of student diversity, with high expectation of all students and promoting interaction among diverse students will help all students feel safe, respected and important as they engage in rigorous curriculum.
Cooperative Learning	Enhances student satisfaction with their learning experience; boosts self-esteem and positive cross-cultural relations.

Learner Outcomes While mastering academic standards as measured by the standardized tests will be utilized for planning and assessing learning progress and gains, expected outcomes for learners are broader than the mastery of state required academic standards. Focus on broad educational goals that blend academic and 21st century objectives will create a strong skill foundation for students to achieve success in higher education, as well as in the world of work. For example, in a stock market unit, students will use mathematics skills to analyze, purchase and sell stocks and calculate profits and dividends.

By engaging in, rigorous and innovative curricular activities all learners will: a) master academic standards beyond those required by the Florida Common Core State Standards; b) develop critical thinking skills, creativity, problem solving and self direction; c) use technology as a tool of learning, communicating and working; d) communicate using traditional and digital tools in a multicultural setting; e) develop individual study habits necessary for success in higher education; f) use engineering design process to explore and explain the world around them; g) develop 21st century skills needed for success in increasingly global society; and h) work collaboratively to create, problem solve and engage in a variety of real life applications.

Curriculum Development - To assure quality instructional programs that engage and teach all students, each school will develop consistent, standards-based curriculum related to the magnet theme and guided by each school's academic goals and objectives. Polk uses districtwide curriculum maps, developed by local educators, giving teachers in core subjects the expected scope, sequence, and time frames for their courses. The curriculum maps outline topics, key concepts, essential questions and vocabulary students need to master each strand of the standards.¹⁵ Teachers in each ***EduSTEM*** school will have lesson planning time each day to

¹⁵ Polk Curriculum Maps web pages are indexed at <http://moodle.polk-fl.net/mod/page/view.php?id=26011>.

integrate benchmarks from the curriculum maps into engaging units of study. **EduSTEM** will provide teachers with substitutes for planning time during the school year and supplementary time on Saturdays, summer, and /or after school. Also, until curriculum is completed, field tested and implemented, **EduSTEM** will yield time for teachers to articulate between middle magnets and their elementary feeder magnets, to assure curricular alignment and continuum. A sample unit outline and a sample interdisciplinary unit planning tool appear in the attachments.

Pedagogy – The district will design **EduSTEM** instruction after high performing schools researched by Douglas Reeves, which implemented five key practices that significantly impacted student performance: a) laser focus on student achievement; b) clear curriculum choices; c) frequent formative assessments and multiple opportunities for improvement; d) collaborative scoring of student work; and e) nonfiction writing across curriculum (Lassiter, 2011). **EduSTEM** teachers will document replicable, quality education practices. These cadres of educators will then serve as a district model for academic improvement. To improve student achievement, **EduSTEM** will include:

- School wide systemic curricular reforms
- Research-based instructional practices
- Rigorous STEM based themes
- Support for all students
- Intensive professional development and support for teachers

School wide Systemic Reforms to Raise Academic Achievement of All Students

Standards-Aligned Units of Study- At all **EduSTEM** schools, teachers will write standards-based units of study mapped into a rigorous, relevant, differentiated curriculum with choices of learning paths for multiple intelligences. These units will be guided by the Common

Core State Standards for mathematics and language arts adopted in Florida, and by the newly drafted Next Generation Science Standards. Excellent trainers, including Douglas Reeves' Leadership and Learning Center and Heidi Heyes Jacobs' Curriculum 21 Associates, will demonstrate for, and follow up with teachers for deep understanding of the concepts and rationale behind each portion of the curriculum. As pioneers in the field of curriculum mapping and unit design, these organizations will help teams of teachers to:

- unwrap (also known as unpack) standards—dissect them into essential parts so that teachers address all in appropriate scope and sequence;
- select the priority standards through analysis of standards' endurance, leverage, readiness for the next level of learning and correspondence to new national testing;
- analyze cognitive complexity of standards using Webb's Depths of Knowledge;
- determine and create big ideas and essential questions;
- create appropriate formative and summative assessments and scoring guides/rubrics; and
- develop performance tasks that will lead toward mastery of standards, including necessary scaffolds and differentiation. A sample differentiated lesson plan is attached.

Teams of classroom teachers will work with school and district specialists, appointed for their expertise, to write the units aligned with the standards. Each school will schedule common planning time for teachers to collaborate on these instructional units. Please see the attachment, "Highly Motivational Focus Areas."

Quality Assessment Design - Burke (2010) notes that "teachers who draw upon a rich repertoire of both formative and summative assessment strategies capture the strengths, weaknesses, interests, styles and motivation levels of their learners." (Burke, 2010, p.26)

Teachers will learn assessment strategies that follow individual student progress and inform

how to differentiate needs and remedies. At all sites, assessment design will include effective formative assessment embedded in daily instruction and use of common formative assessments to determine students' progress and needs, and guide instructional decision-making. Black and Wiliam (2010) analyzed the impact of formative assessment on student learning and concluded that that “the gains in achievement appear to be quite considerable and among the largest ever reported for educational interventions.” (Black & Wiliam, 2010, p.91) Furthermore, Stiggins and DuFour (2009) note that “formative assessment, done well, represents one of the most powerful instructional tools available to a teacher or a school for promoting student achievement.” (Stiggins & DuFour, 2009, p. 640)

- ***Embedded Formative Assessment*** - Frequent in-class formative assessments and multiple opportunities for improvement with feedback will guide students in mastering academic benchmarks. Examples of daily formative assessments are journals, exit tickets, response systems, white boards and student self-assessment. Intentional and ongoing, standards-based formative assessments in the classrooms will help teachers provide a descriptive, targeted feedback to guide each individual student toward mastery. A sample, four-minute, formative assessment and procedure appear in the attachments as “Ticket in the Door.”
- ***Common Formative Assessments*** - All teachers will learn to write and use assessments in common across grades to measure mastery of prioritized standards. Standardized formative process will include weekly data-team meetings, development of common formative assessments during collaborative planning time, collaborative scoring, data analysis and instructional decision-making based on assessment results. Stiggins and DuFour note that “when they [assessments] are common and intended for formative use, teachers can pool their

collective wisdom in making sound instructional decisions based on results. “(Stiggins & DuFour, 2009, p. 642) A sample classroom assessment for a science exercise is attached.

Data-Driven Instruction - To maintain laser focus on achievement, all instructional decisions will be guided by data on student progression toward mastery of standards and concrete evidence of student learning. Groups of teachers organized as instructional Data Teams or Professional Learning Communities will follow protocols that make formative process free of subjectivity and bias, such as collaborative scoring and team development of assessments. Teams will chart and analyze data to determine student progress, assure that instruction is aligned to standards, and plan individualized strategies to meet students’ needs. School-based Resource Teachers will train, coach, and monitor the collaborative teams. More teachers will learn to be trainers to maintain data-team capacity at each school. A sample report showing Data Team analysis across several classrooms appears in the attachments.

21st Century Skills - **EduSTEM** schools will emphasize 21st century skills throughout the curriculum. Partnership for 21st Century Learning states “within the context of core knowledge instruction, students must also learn the essential skills for success in today’s world, such as critical thinking, problem solving, communication and collaboration.” A description of these skills is attached. 21st century skills will be embedded in each standards-aligned unit.

EduSTEM will emphasize integrating technologies for learning, communication and demonstration of knowledge. A sample project online says, “The governor of Florida wants to revive mining ghost towns in Florida and make them into living museums, like Plymouth. He has appointed you to the city Planning Board to reconstruct the old ghost mining company town, Brewster. Your City Planning Board has to create a presentation to the Florida

government on how to reconstruct Brewster.” Role descriptions follow for students to play a geographer, an economist, a social services specialist, and a lawyer.

Addressing the Digital Divide

EduSTEM invites students to explore in a technology-rich and innovative learning environment. While many households today have the luxury of Internet access, computers and software, many Polk students still lack technology in the home. To address this concern, *EduSTEM* will partner with community organizations and local businesses to assist students in bridging the digital divide.

School Laptop Banks - Each school will have at least a class set of laptops available for checkout in the media center. Teachers will sign up in the media center when projects will require at-home technology work to assure that there are sufficient laptops to support the identified project. Teachers will notify the media specialist of the software programs that need to be loaded on the laptops in order to complete these activities. Parent volunteers will work with the media specialist to pre-load this software and ensure these laptops are fully charged, packed in the laptop bags for checkout and have all necessary supplies.

Community Technology Centers - *EduSTEM* will send partnering community centers and libraries E-alerts that student projects are underway and may require after-school technology support. Winston and Lincoln are located close to the Larry Jackson branch of the Lakeland Public Library, which offers 20 computer stations with Internet access. The district has equipped 30 community centers, churches and other sites willing to host children and their families, with computers for public use, and 11 are in Lakeland. Girls, Inc. offers after-school programs with computer labs. Polk School Board member Kay Fields is the head of Girls, Inc in Lakeland and is extremely supportive and sensitive to filling digital needs for the girls she serves. The Dundee

Town Library is located one mile from the school in the center of town, and it also offers computers with Internet access.

Community Gathering Places - Local business partners that provide free Internet access at their places of business have pledged to make coupons available to students and their families so that students can access the internet at the local McDonald's, Panera Bread Company or local coffee shops. These coupons may include a discount on purchases, free small drinks or desserts, two-for-one specials and other incentives. In addition, the PTA will contribute coupons from local newspapers and circulars that assist in providing low-cost options for students to work and enjoy a snack. PTA and academic booster clubs will also use gift cards and other incentives as rewards in the Accelerated Reader literacy program and math skill competitions to further provide access at these business locations.

School Media Centers - Parent volunteers will staff school media centers before and after school to allow students access to printers and additional computers.

Research-Based Instructional Strategies

Focus on Research-based, Effective Strategies - As students' needs are determined based on formative assessments, teachers will select from a variety of research-based instructional practices that will meet differentiated needs of students. Marzano, Pickering & Pollok (2001) found the most successful instructional strategies to be a) identifying similarities and differences; b) summarizing and note taking; c) reinforcing effort and providing recognition; d) homework and practice; e) nonlinguistic representation (graphic organizers); f) cooperative learning; g) setting objectives and providing feedback; h) generating and testing hypotheses and i) questions, cues and advance organizers. To connect and apply these strategies, staff at all sites will be receive training and ongoing support. For example, teachers

can use the Cornell note-taking system starting in elementary grades, with guided practice under the Resource Teachers. A sample template for grade 4 appears in the attachments.

Nonfiction Writing Across Curriculum - According to Reeves, “When students improve the quantity and quality of their writing, they improve in reading comprehension, math, science, and social studies.” (Reeves, 2010, p. 46) Non-fiction writing is an important strategy that raises student achievement both in learning how to write and in content knowledge and understanding. (Peery, 2009). A four-year study by the National Science Foundation concluded that students who write in science classes perform higher on standardized science tests than their peers who do not. (Klentschy, Garrison and Amaral 2000) Teachers will learn to use various nonfiction strategies across curriculum so that students write throughout the day. Example strategies include note taking, graphic organizers, reflective writing, justifications, scientific argumentation, summaries, journals, use of technology tools such as blogs, know/want to know/learn charts, and creative writing to deepen understanding. A sample student blog appears in the attachments to illustrate writing across the curriculum.

Quality Literacy Instruction - **EduSTEM** will implement a reading program that addresses critical elements of reading tied to the Common Core Standards, with literacy integrated in all areas of curriculum. Strategies for these skills addressing the diverse population will include direct instruction, modeling, guided practice, independent practice and opportunity for application and generalization of skills. Computer-supported reading centers and guided reading groups will feature immediate, intensive intervention for students who have difficulties meeting benchmarks measured with the frequent, formative assessments. Extending the required elements of the K-12 Comprehensive Reading Plan, elementary magnet sites will develop challenging curriculum that applies and generalizes reading skills. Reading units and plans will

include use of “trade” books and focusing on application of reading skills and in-depth study of quality literature. Teachers will use nonfiction text to teach reading in all subjects, as students integrate knowledge from multiple sources and engage in research projects. In addition, students will engage in technology-rich experiences such as Webquests and thematic research projects to generalize reading skills across genres, subjects and publication media.

At the secondary level, **EduSTEM** will follow state guidelines for extended reading time for students performing below grade level as measured by standardized tests. Teachers will embed reading instruction throughout the day so students generalize and apply literacy skills for a variety of purposes. Challenging, cross-curricular projects, in-depth studies and student-led ventures will cause students to practice and extend literacy skills by application.

Project Based Learning is an instructional approach built upon authentic learning activities that engage student interest and motivation. These activities are designed to answer a question or solve a problem and reflect the types of learning and work people do in the everyday world outside the classroom. Students will interact with cutting-edge technology, learning to select appropriate tools to create and share knowledge with local or global audiences. Units will emphasize self-direction, application of learning skills to real life, creativity and teamwork to reach students of all backgrounds and learning styles. The projects approach will integrate 21st century skills that tie academic learning to the skills of the 21st century workplace. An illustrative lesson plan appears in the attachments, called “Forget Me Not Summary.”

Inquiry Based Learning supports development of critical thinking, concept understanding, problem solving, and content learning by encouraging students to develop questions about the world, make connections between self, school and society, and apply integrated thinking to solve real problems. This strategy gives students multiple paths to find

solutions to problems. Teachers will use inquiry to help students develop creativity and critical thinking skills and improve understanding of critical science and mathematics concepts at the highest levels of cognitive complexity.

Concept-based learning is a three-dimensional model that frames factual content and skills with disciplinary concepts, generalizations and principles. This type of learning plays a prominent role in International Baccalaureate curriculum. Concept-based learning raises the bar for curriculum and instruction by shifting the design focus to the conceptual level of understanding. Teachers use facts in concert with concepts and generalizations to improve higher-order, synergistic thinking. Facts provide the foundation and support for deeper, conceptual thinking and understanding. Concept-based learning supports student inquiry and constructivist learning to support personal meaning-making. (Ericikson, 2012)

STEM-Infused International Baccalaureate Program – The rigorous academic program will feature a STEM-infused International Baccalaureate program for elementary students (called the Primary Years Programme, or hereafter Primary Years IB) and a Middle Years Programme (Middle Years IB) for the middle grades 6-8. This means entering kindergartners can stay in the same feeder pattern through the Haines City International Baccalaureate High School and earn college credit and an International Baccalaureate diploma. The attached professional development plan (see Priority 4 attachments) shows how teachers will learn and use high yield strategies such as differentiated instruction and scaffolding to ensure that all students will succeed, regardless of socio-economic or academic backgrounds.

This magnet school will liberate children from textbooks and engage them in deep understanding of concepts ultimately tested to measure their mastery of state-adopted curriculum. Their memorable lessons will take them to monitor hatching baby chicks, travel the

world on electronic tablets, and criticize great works of art through the eyes of farmers, nutritionists, optometrists, or care givers. (Sample lesson descriptions follow.) The International Baccalaureate curriculum delivered in project-based, hands-on lessons will stimulate student interest and help children relate academic learning to real-world experiences.

Primary Years IB, also the magnet attractor at Lincoln Avenue Academy, focuses on the student as an inquirer, both in the classroom and in the world outside. It is guided by six, interdisciplinary themes of global significance, explored using knowledge and skills derived from core subject areas:

- Who we are;
- Where we are in place and time;
- How we express ourselves;
- How the world works;
- How we organize ourselves; and
- Sharing the planet.

International Baccalaureate includes teaching attributes that promote academic rigor and a personal value system leading to international-mindedness. The teachers will learn to help students become: Inquirers, Knowledgeable, Thinkers, Communicators, Principled, Open-minded, Caring, Risk-takers, Balanced, and Reflective (ibo.org). These attributes align to the “21st century skills” embedded in Common Core State Standards, and to cooperative problem solving that anchors our STEM approach.

Primary Years IB focus on inquiry accommodates focus on STEM subjects. The transdisciplinary nature of program lends itself to STEM integration in which we will use the

engineering design process to solve authentic problems. Students will apply academic skills and up-to-date technology as they are learning about world around them.

The Middle Years IB curriculum spirals eight subject groups each year: 1) **Language A** – the school’s language of instruction (English); 2) **Language B** – an additional modern language learned at school (Spanish or French); 3) **Humanities** – history and geography; 4) **Sciences** – earth science, life science and physical science; 5) **Mathematics** – number, algebra, & geometry; 6) **Arts** – visual and performing arts; 7) **Physical Education**; 8) **Technology** – computer and design technology. Teacher materials promote the stated IB learner profile with a) aims and objectives; b) essential concepts; and c) scope and sequence.

In *Teaching with the Brain in Mind*, Eric Jensen states that “our brain has a ‘baseline’ of neural connectivity, and enrichment adds to it. Students can graduate from school with a ‘baseline’ or an ‘enriched’ brain.” Engaging students in new cultural courses and expanding the opportunities for real-world application will open students to an intercultural awareness and develop students with enriched brains. The curriculum will challenge students academically, and it will accentuate the interrelatedness of the disciplines, preserving benchmarks in individual subjects in inter-and transdisciplinary study. The eight subjects to be studied each year of MYP include 1) **Language A** – the school’s language of instruction (English); 2) **Language B** – an additional modern language learned at school (Spanish or French); 3) **Humanities** – history and geography; 4) **Sciences** – earth science, life science and physical science; 5) **Mathematics** – number, algebra, & geometry; 6) **Arts** – visual and performing arts; 7) **Physical Education**; 8) **Technology** – computer and design technology.

Students will master benchmarked, essential concepts with increasing rigor each year in these eight subjects through a variety of venues and methods. Students who need extra

instructional support will be have extra learning time and tutoring. The school will feature internationalism and multicultural interaction, a cosmopolitan atmosphere through different activities for students, teachers and parents. In their professional development, teachers will master and practice structured inquiry, problem-solving, critical thinking to solve real-world problems, project-based learning, global environmental issues, student service projects, collaborative learning, and internationalism.

An example of the interconnectedness of STEM-infused IB strategies is in the area of Communication, encompassing language instruction through literacy, social studies through global awareness, and interdisciplinary approaches to technology and graphic arts. IB stresses the fundamental importance of communication, verbal and non-verbal, in realizing the aims of the programs. A good command of expression in all its forms is fundamental to learning. In IB classroom, communication is both an objective and an assessment criterion, as it supports understanding and allows student reflection and expression. Teachers and students will use the technology such as iPads to access challenging curriculum appropriate for diverse learners. For instance, teachers may use the tablets to lead students in accessing the free app *Educreations*, which turns the iPad into a recordable whiteboard. With voice recording, realistic digital ink, photo imports and simple sharing through email, Facebook or Twitter, students will communicate ideas from anywhere. They will create an animated lesson simply by touching, tapping and talking. The IB focus of communication will be emphasized as students use the iPad and *Educreations* to explain a math formula, add commentary to photos, diagram a sports play and more. In addition, the learner profile area of communication assures that students understand and express ideas and information confidently and creatively in more than one language and in a

variety of modes of communication. It also emphasizes that they work effectively and willingly in collaboration with others.

Students in the primary grades can read the traditional Jewish folktale *The Button Story* as well as the American West version entitled *'Til the Cows Come Home* in which the author uses cowboy language in an engaging tale of a young cowboy, talented in making saddles and bridles, who receives a sturdy piece of leather from a grateful cowpuncher. Although many of the items made from this leather eventually wear out, he is able to resurrect pieces to create various needed items throughout life. Not only does this support English/Language Arts and Social Studies core content it also provides agriscience content such as: animal systems, Environment and Natural Resources, and Land Use.

The communication emphasis will be spiraled throughout the curriculum and merged with the agriscience focus with stories that could include *A Hog Ate My Homework* by Gary Metivier; *A Handful of Dirt* by Raymond Bial; and *A Young Shepherd* by Kat Urbigkit.

Another example of the relationship between a STEM-infused, IB-focused curriculum, and the magnet attractors that are central to the development of this program, is in the SmartBoard lesson “Chinese Plate with *Cherries and Bean Pods*,” which focuses on the seventeenth century artwork of Giovanna Garzoni. In this lesson, graphic arts, fine arts, agriscience, and visual communication are connected as students view cherries as both art and science. Writing assignments integrated into this SmartBoard lesson help students use vivid language to defend their critical evaluation of this painting. Additionally, students will address another of the three main IB components, global awareness, as they investigate the Italian culture at the time Giovanna Garzoni painted. Studies could include other topics such as 1) where various varieties of fruit trees grow and 2) how population migration and expansion have

impacted the variety and abundance of crops.

Teachers will weave STEM best practices through classroom instruction and in students' choices of elective subjects. For example, kindergarten students will apply science and math concepts to build a shelter for newborn chicks that hatched in the agriscience lab. Students will use engineering design process to design shelter under various constraints such as availability and type of materials and dimensions. At the same time, students will have to understand needs of living beings, such as air, food, water, and safety, to make their chick shelter. Working in cooperative teams, students will present to peers by using concept-mapping software. This is a demonstration of "How the world works." to promote understanding how people use scientific knowledge and technology to impact the environment.

In the middle grades, students will choose STEM-based electives, such as fabrication lab and graphic arts, to create a variety of products, applying math and science concept in real life environments.

Fab Lab - The fab lab program was started at Massachusetts Institute of Technology as the college students explored how a community can be powered by technology at the grassroots level. A fab lab (fabrication laboratory) is a small-scale workshop offering classroom digital fabrication. The fab lab will be equipped with an array of flexible, computer-controlled tools that cover several different length scales and various materials. The fabricator can extrude almost any shape, including technology-enabled products generally perceived as limited to mass production. Students will see the potential applications of STEM curriculum by creating devices for projects, community service outreach, and applications in other classes, as well as in organizations such as the Future Business Leaders of America. These devices can be tailored to local or personal needs in ways that are not practical or economical using mass production.

While the middle school students use the Fab Lab, the elementary schools in ***EduSTEM*** will use smaller-scale Discovery Labs to ensure that all students have hands-on engineering opportunities from the start of their education.

Fab Lab equipment includes laser cutters which etch designs, or cut flat sheet material such as acrylic, to make objects as varied as hall passes, decorative binders and signs. Students can build a chair with software called Sketch-Chair and a machine called ShopBot, which can cut, carve or drill wood or metal. The laser cutters and milling machines use subtractive technology in which a block of material gets chiseled into a model by a laser or spinning drill. In the Fab Lab, students learn to cooperate in group projects through purposeful lesson design, teacher monitoring and guidance, and independent practice. Fab Lab curriculum is attached.

STEM-Infused Graphic Arts Program - The arts standards respect the multiplicity of cultures represented at Dundee Ridge Academy and Jewett School of the Arts. They allow students to experience the arts from the perspectives of American culture and worldwide ethnic, racial, religious, and cultural groups. Graphic design is a creative process that combines key elements of STEM with art and technology to communicate ideas. This program will develop the creative talents and skills of students using computer-driven software programs. The content includes STEM-focused, practical experiences in computer-generated art and text, graphic design, graphic production, electronic design skills, preparation of electronic layouts and illustrations, and development of specialized skills in multimedia presentations.

The goals of the program are to prepare students to use the broad range of new technology available to designers for creative generation and presentation of projects; enable students to explore graphic design from many points of view, as well as a creative thought process requiring both inquiry and critical thinking; and provide practical student experiences in

written and oral communications, problem solving, and team building. These concepts lend themselves to a curriculum that blends engineering and graphic arts in a project-based setting for students to make practical life use of IB principles.

Guiding principles for the graphic arts education program will be further developed during Year 1. Teachers will work in grade-level, interdisciplinary teams and in subject area vertical groups to refine the graphic arts curricula and projects. The students will make connections between concepts in graphic arts and other subject areas. These standards will incorporate the International Baccalaureate focus on communication and global awareness at Dundee Ridge, and will reinforce the specific components of STEM that are embedded in the interdisciplinary graphic arts design curriculum. These standards require the student to connect and apply what is learned in the arts to other art forms and other subject areas and to careers.

The arts standards recognize digital and electronic media as essential tools for learning and for expanded forms of expression. New technologies for graphic arts and arts-related computer applications will lead to emerging graphic arts-related careers, vital skills given that the demand for individuals with artistic skills and career orientations has been steadily growing.

Graphic Design Overview

Grade	Topic	Description	Project Outcomes and Examples
K-1, 6	Introduction to the principles of graphic design	Balance, text, and graphics, elements of design (illustrations, logos, layout)	Ability to convey the message in a pleasing and attractive manner
2, 6	Theory of graphic design	Alignment, consistency, contrast, proximity, white space	Mastery of layouts showing theoretical elements

K-3, 6	Shape, spacing and rhythm	Introduction to drawing; understanding the impact of placement, shape and spacing	Using these concepts to convey appropriate context
3-5, 6, 7	Color, texture and imagery	Effectively blend and balance imagery with texture and color	Use these design elements to recede or “pop” images
K-8	Technology applications	Developing the knowledge of how technology assists in the design process	Creation of projects using the various technology applications
2, 6	Graphic design process	Understanding visual challenges graphic designers overcome	Successful implementation of client design briefs
2, 3 6, 7	Conceptual solutions	Identifying and problem-solving real-world visual obstacles	Development of a logo which represents the ideals of a company
K-8	Creative applications	Translate classroom learning into product development	Creation of a business card for a mock company
K-3 6,7	Visual/conceptual problem-solving	Solving technical problems with creative solutions	Development of student recognition certificates
4,5 7,8	Visual and conceptual problem-solving (3-D)	Solving 3-D technical problems with creative solutions utilizing technology such as the Fab Lab	Development of student recognition incentives such as key rings, trophies, etc.
K-8	Design process for real-world application	Research creation of thumbnails, refining sketches to work up visual solutions	Development of step-by-step processes and key elements of a design project

7, 8	Grid theory	Advanced principles of space, flow and rhythm	Development of a layout for a website or multi-page document
4, 5 7, 8	Graphic information design	The 2-D and 3-D conceptual design translated into the actual product	Using the fabrication lab to create a visual representation of a design
K-8	Career exploration	Develop a clear understanding of the applications of graphic design in employment opportunities	Understand the skillset, employment opportunities, and pay scales related to graphic arts careers
5, 8	Culminating project	To be determined by graphic arts teachers in collaboration with grade level teams	

Personalized Learning - Teachers in **EduSTEM** schools will move away from directed instruction and become immersed in differentiated instruction using small group, hands-on learning opportunities, technology in the classroom, and community service learning. More important, students in **EduSTEM** schools will learn to make personal choices that impacts their own learning, and to maintain personalized learning tools, such as bookmarking favorite Internet sites, collecting collaborative project notes in an electronic Dropbox, and checking assignments on a student portal. Lincoln Avenue Academy and Dundee Ridge Academy will embed the International Baccalaureate learner profile and tenets. The teachers will require multi-media equipment to offer this learning environment.

Generally, “personalized learning” refers to students being able to direct how, what, when, and where they learn, both in and out of the classroom, emphasizing parent involvement

and meaningful student-teacher-parent relationships. The **EduSTEM** schools will approach personalized learning by integrating this with the extensive professional development plans described in the attached professional development plans for each school (Priority 4). Giving students different ways to learn will allow students to make choices according to what they find personally motivating. Each child can adjust pacing and learn by personalized modes of instruction. Teachers can leverage student interests. The choices are accompanied by students' accountability to keep on track and recognize progress. Teachers will guide students to apply new knowledge and skills in the context of their own lives, and to incorporate social and practical workplace skills. Personalized learning will require a considerable change in pedagogy.

Other Technology - Dundee Ridge Academy will use a foreign language A/V technology learning laboratory for enhanced foreign language and international cultural learning. It will open with 30 student computer stations and one instructor management station with software for Spanish and French. All Dundee Ridge students will study a foreign language. The lab will provide interactive technology, a projector, Internet access, wireless headsets, microphones, digital voice recorders, a digital and video camera with tripod, and multiple international videos, a multi-standard DVD player, a wide-screen TV, and a sound system with speakers, a printer, and a scanner. It will also include a set of iPads to assist with language acquisition through differentiated activities including translated song lyrics and e-Books, and repetitive vocabulary practice. The teachers will use their existing mobile laptops for individual and group projects and for student use before and after school. Each teacher will use a SMART response system as an engaging, timely, interactive, formative assessment tool.

Each teacher's classroom will include a document camera used to make student work interactive and timely and a SmartBoard which will support Middle Years IB learning. For

instance, students in Global Tech class might use the SmartBoard to create an interactive presentation for the community about the dangers of mercury in today’s cosmetics.

EduSTEM will enhance the Lawton Chiles Middle Academy demonstration site with a Fab Lab so that Lawton Chiles teachers—already experts in STEM applications and Middle Years IB—can show hands-on exercises to their peer teachers at Lincoln Avenue Academy and Winston Academy of Engineering to incorporate engineering adventures in their instruction. The Lawton Chiles teachers, for example, have been using Venier probes for years, and the Fab Lab expands the hands-on features the teachers will use in their lessons. In order for sixth graders to be prepared to effectively use these components, it is imperative that academic building blocks related to the STEM components be identified and addressed at the elementary level. Dundee Ridge Academy will also include a Fab Lab in its integrated technology coursework.

(iii) Encourage greater parental decision-making and involvement.

A highlight of *EduSTEM* is that it gives parents unprecedented policy input in two arenas. This feature builds on a lesson the district learned when it assumed our Head Start program two years ago: Parents who are empowered to make policy decisions take ownership of their results, and are more prone than those limited to “advisory” roles to take on leadership capacity. We hope to recruit teachers from among our Head Start parents, and we count on developing advocates, recruiters and activists from among our magnet parents.

The times, purposes, and audiences at 16, neighborhood-based, public meetings to plan *EduSTEM* appears in the attachments. The Diversity Council (coordinated by the Office of Diversity Management) and the Polk District Parent Leadership Council (coordinated by the ESOL Department) emphasize outreach to their constituents and have succeeded in influencing

district practices. The same councils reviewed and recommended assigning neighborhoods not meeting at least three of four criteria (free lunch, English language learners, racial minority groups, special education, but adjusted for each of the four magnet zones in the district) to Group One, Group Two or Group Three as they deem most appropriate.

Polk's Superintendent assigned seats on the District Strategic Planning Committee, formed in January, 2013 to update the three-year-old plan, to representatives from all geographic and demographic groups in our district. These committees will recommend action plans to be approved by the School Board in June, 2013. Dr. Stewart's letter of invitation to the Concerned Citizens lobbying group is attached.

The district and each *EduSTEM* school will inform the public about the opportunities at new and revised magnet programs through the district web site as well as through the districtwide telephone messages using the ConnectEd program. Clear directions for application (available in multiple languages) will be posted on the district and school websites and available at magnet and feeder schools. In addition, grant funding will be used to purchase oral translation services, automated written translation services and to translate documents. Point-in-time translation will allow us to interpret for parents at events as needed.

During the first year, *EduSTEM* will host open houses and informational tours for parents of interested students. To make sure all parents internalize that their child is a welcome addition to the school family, regardless of race, socio-economic status or gender, the magnet school staff will do its best to overcome reasons why some parents choose not to get involved: there are single-parent families, parents working multiple jobs, and perceived barriers from language, cultural and socio-economic differences. For example, a growing number of parents do not speak or read English well enough to communicate with teachers or other school staff.

An additional challenge is the disconnect between the school's perception of how welcoming that school is in contrast to a parent's perspective. Often many parents hear from the school the first time when there is a problem, creating a negative association to school involvement. **EduSTEM** will use the findings of a WestEd study based in Hawaii that found a 45% increase in parent involvement (School/Community-Based Management study) resulted from identifying and surmounting barriers based on a five-step strategy:

- Reach a shared understanding of what form parent involvement will take.
- Develop strategies for involving more parents.
- Provide parents information on the school and ways to get involved.
- Involve those parents that are hardest to reach.
- Reach out to parents who are reluctant to participate in the school.

Equitable Digital Access - **EduSTEM** will assure that digital divide does not prevent families from full participation. Details of this plan appear in Project Design, Section ii.

Parent outreach programs and ongoing communication at each EduSTEM site - **EduSTEM** schools will carry out action plans to continuously communicate with families. All **EduSTEM** schools will provide families with paper and electronic copies of quarterly, school-wide newsletters detailing school events and parental involvement opportunities. Administrators will use the ConnectEd system to deliver information about school events and opportunities. ConnectEd is a districtwide phone and email messaging system that reaches all families via phone and/or email addresses provided in the child's enrollment package. Schools will enhance their websites, tweet updates and reminders, and send emails as well as traditional paper announcements. Each **EduSTEM** site will maintain an informational web site, consistently updated with current school events.

Each student will use an agenda to record assignments and events. Teachers will play an active role in involving and informing families. Each grade or subject area professional learning community will publish a newsletter to provide parents with curricular information and classroom volunteering opportunities. Parents from all backgrounds will be encouraged to participate in school wide events. Site Leadership teams made up of site principal, assistant principal and grade or subject level will use surveys, polls and ConnectEd to gather input from parents in setting up school wide events such as academic nights, workshops, multicultural, community and career related events.

Teachers will inform families about programs and each child's progress through curriculum information meetings and portfolio conferences. Each grade level faculty will host curriculum information meetings at the beginning of the school year to tell parents about school and grade-level expectations, major events and curriculum maps. During these meetings, parents may ask teachers and administrators questions about the magnet theme and curriculum at each grade. Teachers will meet with parents to review each student's academic progress at least once a year (see attachment). Schools will hold meetings at times to accommodate parents' work and transportation schedules and explain strategies for parents to help their children in school.

Parent volunteer programs - Each *EduSTEM* site will maintain a parent volunteer program. The parent volunteer program will have a task of recruiting, training, encouraging and scheduling parents to volunteer in meaningful roles at school. In the Polk School District, all school volunteers must apply and undergo background checks to be allowed to volunteer at schools. Staff will set up computers to sign up parents and families to the Volunteer system. Assistance will be available for parents with diverse linguistic needs.

To start the year, Parent Teacher Organizations will give families a list of volunteering

opportunities. One staff member and one parent member will be assigned as volunteer coordinators at each **EduSTEM** school. Volunteer coordinators will keep suggestion boxes for parents to voice opinions and suggestions. They will give special attention to volunteers who cannot contribute during working hours, such as at Saturday school beautification, the Martin Luther King day of service, and after-school student performances. Schools will recognize volunteers in web sites, newsletters and annual volunteer events.

Parent involvement and education workshops at EduSTEM sites - To afford parents avenues to decision making and involvement, **EduSTEM** will offer workshops and informational sessions on a variety of topics of interest to families. Topics such as Internet Safety, specific learning needs or issues, or career and upper school options may be addressed (see attachment). Workshops that foster child /parent interaction also may be offered, such as workshops on technology tools. The PTA will host parent advocacy workshops to discuss important issues affecting schools such as legislation or school funding. **EduSTEM** teachers will solicit community visitors for multicultural programs, outreach and activities.

Parent – School commitment agreements – The nature of magnet schools in itself increases parental involvement. When parents complete an application to participate in the program of interest, they are automatically involved in decision making about their child’s education. Upon enrollment to the magnet program, all parents are asked to sign a commitment agreement that pledges support to their choice program. A parent contract appears in attachments for Project Design. Such agreement will affirm parental support to their child’s magnet program, as well as to supporting their child’s educational needs. Parents will commit to attending the beginning of the school year informational meeting that will help them better support their child’s efforts in the upcoming year

Active on-site parent organizations – The Resource Teachers based at each magnet will foster active *EduSTEM* parent organizations. Parent-Teacher Organizations will offer a means to develop strong family-school partnerships. Such a group at each site will link classrooms and parents to support classrooms by interactive involvement and decision making, such as in fundraisers, help for families in needs, support for classroom activities and schoolwide events.

School Advisory Councils are charged by the Florida Department of Education with helping to develop annual School Improvement priorities. Working with school leadership, they publicize and evaluate the School Improvement Plan, support implementation, and review the School Budget. By state policy, the councils reflect the demographic makeup of each school, and demographic balance of members at each site is reviewed annually by the School Board. Information about these opportunities will be provided to all parents in their language. The *EduSTEM* Resource Teachers will survey to assure meetings are scheduled at the time most convenient to the members. The parent groups will have access to the school’s communication tools to inform and invite parents to participate in decisions and initiatives.

(d) Budget and Resources

(1) The adequacy of the facilities that the applicant plans to use

All *EduSTEM* schools can accommodate the numbers of students needed to achieve desegregation goals. Campus maps appear in the attachments, with photo collages showing the campuses and neighborhoods. All are accessible to students with disabilities. No grant funds are budgeted for construction, and the district will transport all magnet students at local expense.

Dundee Ridge Middle School was built in 2000 and is located on a large campus (see the attached “Campus Map.”) Renovations at Dundee Ridge Academy to prepare for the elementary

component as well as updates and exterior work at Winston Academy should be completed with district funding by October 2013. In the past five years, Polk has invested more than \$20 million in these buildings, as shown below.

School	Construction Project	Year Completed	Project Cost
Dundee Ridge Middle School	Agriculture Barn	2012	\$143,457.60
Winston Elementary	Head Start Playground-Shed/Fence	2011	\$23,500.00
	Install Head Start Playground	2010	\$9,500.00
	Install Permanent Walls	2011	\$18,640.00
	Re-Roof Bldg 6 & 10	2007	\$212,226.60
	Resurface P.E. Playcourt	2010	\$20,127.18
Jewett School of the Arts	Extend Sidewalk Cover-Bldg 1	2007	\$30,976.67
	Replace Dance Stage	2010	\$18,272.28
	Replace Walkway	2009	\$19,710.32
	Expand Administration/Remodel Kitchen-Dining	2011	\$4,817,161.77
Lincoln Avenue Academy	Extend Walkway Cover-Café	2007	\$11,161.40
	Install Fence Around Pond	2008	\$14,962.92
	Install Irrigation Lines	2009	\$11,800.00
Total			\$5,351,496.74

- (2) The adequacy of the equipment and supplies that the applicant plans to use**
- (3) The adequacy and reasonableness of the budget for the project in relation to the objectives of the project**

The attached budget narrative includes the following documents.

- 1. **Sub-Project Details** – Each component of the four sub-projects, its purpose and cost
 - a. STEM Integration sub-project
 - b. International Baccalaureate sub-project
 - c. Professional Development sub-project
 - d. Project Quality sub-project
- 2. **Sub-Project Costs** - Cost summary tables listing major components by site and by year
(student selection and monitoring, demonstration site, accountability)
- 3. **Detailed Spreadsheets** – Site-by-site details of complete project costs with summary tables by federal budget form category, by sub-project, and by site

(e) Evaluation Plan

- (1) Includes methods that are appropriate to the project**

This evaluation, spanning the three years of *EduSTEM*, will assist four magnet schools; Winston Academy of Engineering, Dundee Ridge Academy, Jewett School of the Arts and Lincoln Avenue Academy. School leadership teams will use it to improve performance as defined in the “Quality of Project Design.” The evaluation will produce information and reports needed by the United States Department of Education to properly evaluate project effectiveness.

Data Collection

This evaluation will draw on a wide variety of data to provide substance and context for both formative and summative reports. It will employ quantitative, extant data (e.g. enrollment

information, standardized test results) in conjunction with questionnaire, interview and observation data; and qualitative data (e.g. school improvement plans, curriculum materials, professional development records) to ensure a thorough and balanced evaluation.

American Education Solutions will write data collection instruments (surveys, document requests, and walkthrough, observation and interview protocols) to provide sufficient information to address objectives and performance measures and supplement extant data.

Extant data will be used as possible to lessen the burden on school staff.

Student achievement, demographic, enrollment and other data - The contractor will collect standardized test score data (e.g., school and grade-level reading, mathematics, writing, science data) to address performance measures related to student academic achievement outlined in the “Quality of Project Design” for each magnet in this project. Enrollment data disaggregated by race/ethnicity will indicate the extent to which each school and the project succeeds in meeting desegregation performance, including reducing minority group isolation. Applicant pool, student selection and student enrollment data will help explain the extent to which the reduction in minority group isolation is attained and how this area can be improved.

Document requests -The evaluator will collect documentation from magnet school teachers and **EduSTEM** staff to help determine the quality and extent of project implementation. Examples include: ► **descriptions of and dosage** (amount of program delivered) **for units and courses** that present the magnet theme to students; and student recruitment, teacher professional development, parent involvement and planning activities (including an implementation plan); ► **schedules** of school based magnet staff; ► School improvement plans.

Observation and interview data - Evaluators with experience as magnet school practitioners will make observations and collect interview data during three annual visits to each

magnet school. The visitors will conduct walkthroughs, observe lessons, and interview teachers, administrators, students and parents. An observation template appears in the attachments.

Surveys will be administered annually to all magnet school teachers, a sample of students and teachers, and students at comparison schools. The evaluator has developed pertinent survey items and scales with its consultant, Dr. David Silver, a senior researcher at U.C.L.A.'s CRESST Center, and currently, Dr. Jia Wang, a senior researcher at CRESST. The validated survey items, and scale, measure school climate, instructional leadership, professional development hours (formal, collaborative and coaching) and effectiveness, student engagement and motivation, student academic commitment and expectations, student and teacher perceptions of intergroup relations and magnet theme implementation, standards based instruction and systemic reform implementation and parent involvement as well as magnet and professional development dosage.

(2) Will determine how successful the project is in meeting its intended outcomes, including its goals for desegregating its students and increasing student achievement; and

Formative Evaluation and Reporting

The evaluator will aid in continual *EduSTEM* improvement through formative evaluation, an examination of implementation that returns information to *EduSTEM* staff. Formative evaluation includes the study of program fidelity (the degree to which a program is implemented as designed) and reach (the proportion of the target group that participates). Components of fidelity include: ► adherence – the degree to which the program adheres to its goals, plans, activities, timeline; ► dosage – the amount of program delivered; ► quality – the quality of program activities and services; ► responsiveness of participants to program activities; ► program differentiation – unique features when compared to non-magnets.

Formative Evaluation Reporting - Data will be collected, as available, and analyzed and

recommendations discussed with the project director and school staff throughout the year.

Evaluators will deliver the following formative evaluation reports each school year:

1. Reduction of Minority Group Isolation Report - Demographic and enrollment data will be compared with applicant pool, student selection and other data from the previous school year and with performance measures. By November, discussions related to the attainment or partial attainment of performance measures related to the reduction of MGI will help the district and magnet schools modify recruitment strategies and activities to attain better results. (Were outcome targets attained? Was group isolation reduced? By how much? Why?) This report informs the district about its successes in meeting desegregation performance measures (1.1-1.5) and also explores reasons for progress or lack of sufficient progress and possible remedies.

This report will be updated each year in late spring when new applicant pool and student selection data is compared with school enrollment. Measures of fidelity include adherence to the implementation plan, recruitment plans and student selection criteria and procedures; and the “amount” of recruitment. Quality and responsiveness entail changes in school enrollments, especially for entry grades, and size and diversity of applicant pools. Differentiation sees if unique program features were implemented and adequately described to the target audience.

2. Site Visit Reports - After each of three annual site visits, a report will be written by the site visitor and submitted within ten days. It will summarize the findings of the visit and include recommendations for improvement. Site visitors will discuss recommendations with school and **EduSTEM** staff during each visit. **Documentation Reviews**, included in all three site visit reports, will summarize descriptive and quantitative data related to magnet curricula, systemic reforms, parent activities and professional development, and report on: adherence (e.g., activities implemented on schedule), dosage (e.g., the amount of time students, teachers and

parents are exposed to grant activities such as magnet units and courses, professional development and parent activities), quality (e.g., peer reviews of magnet related units and courses). The combined site visit report/documentation review summarizes how much progress has been made towards attaining performance measures especially those related to magnet theme and systemic reform implementation (2.1, 3.1), professional development (5.2) and fidelity of implementation. The reports will help staffs understand if they are on track, and if not, why and how the project activities can be improved.

3. Survey Reports will explore trends such as relationships between magnet implementation and student engagement and motivation, and between professional development dosage and impact. They will include item-by-item results by school, summaries for each school, and, for Years 2 and 3, comparisons between current and the previous year's results.

Summative Evaluation and Reporting

The evaluator will determine the extent to which annual objectives and performance measures are attained. The evaluator will prepare two annual performance reports and one final report summarizing findings, and discuss the results with district and magnet school staffs.

(3) Includes methods that are objective and that will produce data that are quantifiable

This section summarizes the means by which evaluators will assess the attainment of performance measures summarized below from the Plan of Operation:

Measure 1.1-1.4 Reduction of minority group isolation at each magnet school meets annual targets. **PM 1.5** Each school meets the targeted number of annual applications.

Assessment: School enrollment data, disaggregated by race/ethnicity will be used to determine the degree of attainment of 1.1-1.4. Applicant pool and student selection data will be used to determine if 1.5 was attained and explore how performance can be improved for all measures.

Measure 2.1: Each School Improvement Plan will include activities and objectives supporting the adoption of high standards for all students and systemic reforms coordinated with MSAP activities. **Assessment:** Success will be determined through inspection of each school's plan. Implementation success will be measured by performance measure 3.1.

Measure 3.1: All magnet school students will receive magnet theme instruction coordinated with systemic reforms for at least 3 (year 1), 6 (year 2) and 10 (year 3) hours per week. **Assessment:** Unit plan analysis confirmed with surveys, interviews, and walkthroughs. Units and lessons will be peer-reviewed to determine quality. Responsiveness will be determined by surveys which assess student engagement and motivation, academic commitment and expectations, student and teacher perceptions of school climate.

Measure 4.1-4.3: Each magnet school and all student subgroups will attain state proficiency standards (Annual Measurable Objectives or Safe Harbor) as stated in the objectives, by subject, by subgroup. **Assessment:** All students are tested each April. Data are scored, reported, and analyzed by the Florida Department of Education and will be presented in the Annual Performance Reports in tabular form, highlighting the performance targets and how each magnet school – both in aggregate and by subgroups – performed in relation to these targets.

Measure 4.7: In each magnet school, 75% of students will master the magnet curriculum. **Assessment:** School and magnet staffs will develop, by the end of year one, methods to assess student mastery of magnet curricula. Project director and evaluator will approve methods.

Measure 5: Magnet school teachers will receive 30 hours of professional development related to **5.1:** systemic reforms and **5.2:** 30 hours related to magnet theme development and implementation. **Assessment:** (**5.1, 5.2**) Magnet staff will collect professional development data including the type of training, the number of hours provided and the number and names of

teachers involved, with quality determined by survey analysis and interviews, walkthroughs, etc.

Measure 6.1: At least 75% (yr. 1), 85% (yr. 2) and 95% (yr. 3) classes (elementary) or STEM classes (secondary), will reflect their grade's enrollment for each racial/ethnic group and males and females by ± 15 percentage points. **Assessment:** Success will be determined through analysis of class enrollments disaggregated by race/ethnicity and gender.

Measure 6.2: There will be an increase in parent participation at each magnet school each year. **Assessment:** Workshop materials, attendance records and parent interviews will determine parent participation and satisfaction.

Annual Evaluation Schedule:

► Initial meeting with project and district staff (Week 1); ► Refine data collection instruments and plan; refine analysis plan; (Weeks 1-3); Collect data (Throughout year): Enrollment data (Week 5); Site visits including interviews and observations (Weeks 10, 22, 34); applicant pool data (Week 28); Dosage data (ongoing); Surveys administered (Week 34); Survey results reported (Week 38); Documents collected (e.g. units integrated with magnet theme - Weeks 9, 21, 33); ► Formative evaluation including discussion of recommendations (Weeks 3-40); MGI Report (Week 10) MGI/Applicant Pool Update (Week 31); Site Visit- Document Review Reports (Weeks 12, 24, 36); ► Analyze and process summative data (Weeks 34-36); ► Prepare Annual Performance Report (Weeks 36-37); ► Submit report to school District (Week 38). Week 1 is the week the project begins each year.

(f) Commitment and Capacity

(i) Is committed to the magnet schools project

The superintendent and School Board have reviewed and approved this magnet school grant application as part of Polk's February 19, 2013 board meeting. They have pledged their

support to the grant as presented, and to sustain the magnet schools created by **EduSTEM** after the grant expires. Numerous district office staff such as the senior directors of workforce development, facilities, professional development, and curriculum and instruction have committed their time and expertise to the development and implementation of this project.

The Polk County School Board has a long-standing history of commitment to reducing minority group isolation in the schools it serves through the support of nine magnet schools, six choice schools and 23 charter schools. The original eight magnet schools that the district began in 1992 have remained open continuously since then.

Polk's existing magnet schools all have waiting lists, ranging in length from 125 at the smallest magnet to more than 1,000 at larger magnets. The seven elected school board members are responding to community demand by proposing **EduSTEM**. In response, the Superintendent has appointed two of his Cabinet members, the senior directors for Magnet, Choice and Charter Schools, and for Workforce Education, to lead **EduSTEM** planning. They have carried out numerous, community-based planning meetings (a list appears in the Priority 1 attachments) which also included the Assistant Superintendent for Business and Finance and the Senior Director for Facilities.

The Lakeland community has special commitment to support our schools. Mayor Gow Fields is married to Polk County School Board member Kay Fields. They and a second board member are respected professionals from our African-American constituency. Additionally, the Superintendent's Cabinet has literally doubled the percentage of African-American administrators at the central office over the past decade.

The School Board of Polk County has honored the Unitary Status granted by the federal court . Each year the superintendent has endorsed, and the Board has approved, pupil

transportation budgets which do not diminish choice opportunities. This is despite tremendous reductions in overall revenues in recent years.

Indeed, after Hurricane Jeanne ravaged the county in 2004 and electricity was not restored for several days on the east side of the county, we could not yet open schools on the west side because of their intertwined student transportation systems.

<p>(ii) Has identified other resources to continue support for the magnet school activities when assistance under this program is no longer available</p>
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At the end of the grant, student enrollments at magnet schools will earn FTE to support the magnet teaching units there. Equipment and technology will be in place and staff trained to use and maintain it. Magnet schools in this project will build materials and supplies into their annual budgets. The Polk district continues an extra, per-pupil materials allowance for magnet schools above that for other schools, in the interest of maintaining their attractors and continuing unitary status. That will help with laboratory materials. Pledges from the business community are likely to maintain the \$10,000 annual fee per school for the Middle Years International Baccalaureate programs. The district has borne this cost for the Bartow High School IB program for 15 years, and assumed the fee for the Haines City High School IB program in 1996. Although our elected School Board cannot obligate a future board, it has approved the *EduSTEM* project for the Primary Years and Middle Years IB components as well as the STEM components, and the board understands from its experience with the high school programs that certain expenses will remain.

Professional development expenses, particularly teacher time, will be a challenge to maintain, but will be augmented by graduate studies among individual teachers. Also, the district has capacity to add our own online lessons to PD 360, which can link to our online Blackboard

training system. Any training and other school projects documented by the *EduSTEM* faculties, especially with their technology bent, will become accessible to all.

Just as our award-winning Harrison School for the Visual and Performing Arts has sent students to Julliard and Broadway, we expect our new technical engineering programs to generate Ivy League scholars just as our International Baccalaureate schools have.