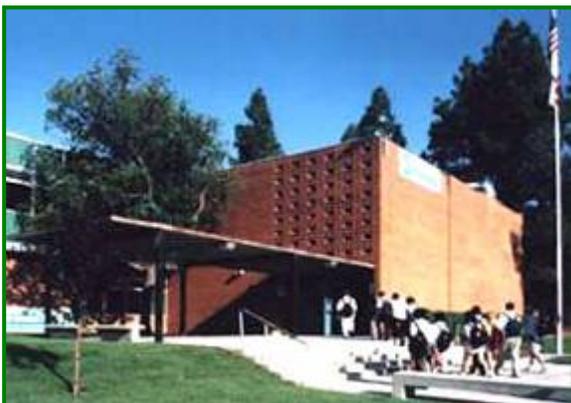


A tour of Anderson W. Clark Magnet High School with Emphasis on Science and Technology (Clark) begins with a visit to the main data frame room, the core of the school's technology infrastructure, dense with wires, boxes, and dials. Explains Principal Doug Dall, "When we converted a middle school to a technology high school in 1998, we wired it for the future; we've had five upgrades of computers and have yet to go back to the district for improvements in our infrastructure." The wiring in all the classrooms is in wire mold and cable trays above the ceilings, configured for easy access; all the desks, cabinets, and furniture are wheeled, so classrooms can be

easily rearranged and converted to new uses. The school has a simple color scheme—green, grey, and beige—so that everything always matches, is orderly, and easily cleaned. The classrooms are logically numbered by floor and building, and the numbers are also used for computer addresses and phone extensions. Everything at Clark has a plan and purpose.

Neatly dressed students arrive by bus from across the district for the school day. The school dress code is "business casual"—solid-colored, collared shirts and khaki pants or skirts (no jeans or corduroys). Faculty members dress the



Clark Magnet High School, La Crescenta, CA  
[www.clarkmag.net](http://www.clarkmag.net) 1078 students, 9-12

White	75%
Asian	18%
Hispanic	7%
Students receiving free/ reduced price lunch	42%
Students receiving SPED services	2%
Students with Limited English Proficiency	13%
Student mobility rate	1%
Student: teacher ratio	25:1

same. Students demonstrate their pride in the school by keeping the building clean and behaving maturely. As one student explained, "We do not do that here," meaning use bad language or get in fights. Administrators and teachers remind visitors to think of high school as a business; that is, the work of education at Clark is serious and directed towards a goal. At Clark, the quality instruction and academic supports result in graduates who not only go on to but complete post-secondary school.

More than ten years ago, a planning task force (the Founders) including more than 80 volunteers from the Glendale Unified School District, area business and industry, and institutions of higher learning worked together to create a



high school that promotes academic success and career preparation through science and advanced technology—"the literacy of our future," as they termed it. The Founders surveyed the community to determine interest and needs and drew on then-current research (*Second to None, Aiming High, and Breaking Ranks*) about small secondary schools with rigorous core curricula. They based Clark on the premise that, in order to be contributing adults in the 21st century, high school students needed to be literate in all aspects of science and technology, both structural and applied.

Today, Clark's stakeholders meet annually to analyze student performance data in an effort to link the classroom hands-on approach to learning content standards. Annually updated, the school plan becomes the map for the next year's improvement goals. Currently, these goals emphasize integrating writing and literacy in all content areas and improving problem-solving skills for students scoring below proficient math standardized tests. Professional development is aligned with the annual goals.

The Founders also embraced the School to Work model, which makes strong connections between school and career. In a foundation course called Technology Literacy, all entering ninth graders are introduced to Clark's four curriculum strands: Math/Science/

Engineering, Computer Applications, Technology Systems, and Digital Arts. In their College and Career Prep class the ninth grade students strategize and map out career plans and high school coursework that is carefully monitored for each student by guidance counselors and administrators. Conceding that some educators resist having students make

decisions about their career at such an early age, Principal Dall argues that research shows that high school students who set clear pathways to careers are more likely to finish high school and succeed in college. Clark's graduates

#### Clark's Expected School-wide Learning Results

Upon graduation, all Clark students will be:

- Effective Communicators who demonstrate competency in reading, writing, and speaking.
- Creative Thinkers who use a wide variety of information sources and strategies in problem-solving.
- Self-Directed Learners who possess the skills for continued lifelong learning.
- Informed and Responsible Citizens who give time and talent to benefit their community.
- Cooperative Team Members who collaborate effectively.

frequently return to visit and tell faculty how well-prepared they were for college; for some, college seemed easier than high school. The school's alternating day block schedule supports a college-like experience for the students.

While Clark is a choice magnet school, it is not a school for gifted students. Clark recruits incoming 9th graders from the district's four middle schools and area private schools. Administrators visit these schools, hold student and parent meetings, and invite interested families for a Saturday Expo on campus. Entering 9th graders must demonstrate a readiness to take algebra and must have a C average in middle school. Typically about 600 students apply for the 300 slots in 9th grade. Admission is by lottery.



Mr. Dall feels that students at Clark show maturity by choosing their high school. "Because they were chosen," Mr. Dall said, "they think they are the smartest kids in the district." He added that while all Clarke's students are not high-achievers, Clark's goal is to make its students think they are the smartest kids around. It is all about confidence, he said. Students said that Clark is known as the voc tech school or "geek" school because of its computer and technical approach to learning but once at Clarke, students are surprised by the challenging curriculum. In a focus group, one student reflected that his time would have been diverted to "other things" in other high schools. "Here I do not have to watch my back," he said. Another said, "School is not only fun but I am learning useful things." In a sign of pride in their school, at the end of a



focus group, students placed their chairs neatly next to the library tables, threw away all the trash from the meal, and made sure their shirts were tucked in as they left library.

Even as a high school of choice with only 1100 students, Clark's diverse student population is similar to many of our nation's high schools. When it opened in 1998, Clark reflected the student diversity at all the district high schools; today, more students come from South Glendale, an area of low-income immigrant families. Once one member of an

immigrant family who lives in the school district finds the resources at Clark, other students from that community follow. In 2005-06, more than half of the students came from families who do not speak English at home. Students who do not have a command of English receive support at Clark, as do students with learning disabilities.

Clark has won many international, national, and state awards as one of America's most successful high schools. The key strategies behind the school's success appear to be intentionality of purpose, a student-centered culture, and high academic expectations.

### Plus 2 Plus 2

Founded on school to career principles, Clark students begin electives in one of four technology pathways (math/science/engineering; technology systems; computer applications; or digital arts) early in high school. Many begin their initial computer networking (CISCO Academy) and computer repair (A+) certifications through industry-based certification programs.

Many Clark graduates attend Glendale Community College at minimal cost, to complete a further two-year Cisco computer networking certification along with general degree courses, then transfer to a four-year university to complete a bachelor's degree in management information systems, computer sciences, or



another field in their area of focus. This career path is called "Two [years in high school] plus two [years at a community college] plus two [years at a four year college/university]."

The Founders intentionally linked technology and science at Clark to southern California's high tech and entertainment fields, and the school has received numerous grants to support its technology programs. Many faculty members have certifications in a trade or science/technology field and these professional development activities are funded through California's Regional Occupational Program (ROP) or Career Technical Education Funds.

### College and Career Prep

Two 9th grade courses anchor students in the science and technology path. In the one-semester College and Career Prep course, students prepare digital portfolios that set the stage for their high school and post-secondary plans. To reinforce their career planning, freshmen are also required to complete at least 10 hours of community service work; many exceed this number and continue in service work.

Using a software system, students take interest tests, explore careers, and locate post-secondary institutions where they can pursue their chosen careers. Students meet with guidance personnel periodically in small groups and one-on-one to update their career plans and keep their expectations for post-secondary education alive.



Many Clark students come from families lacking both post-secondary school experience and funds for a four-year college. In addition to the internships and projects that connect students to area business for potential job opportunities, students use their technology training in summer jobs to support their post-secondary schooling. Advanced placement courses in the last two years at Clark allow students to earn college credit. A substantial number of 12th grade students also

take advantage of the school's close relationship with nearby Glendale Community College in order to attend college courses through the "Jump Start" program. The guidance department works closely with 11th and 12th grade students and parents to understand and fill out the college financial paperwork and make sure students do not miss deadlines.

The second 9th grade course that lays a foundation for the science and technology pathway is Technology Literacy (Tech Lit). Aligned with California technology standards, this four-quarter course taught by subject-area experts introduces students to electronics and computer hardware, to computer business applications, to Internet use and research techniques, and to principles of computer graphic and media design. Each quarter focuses on one of Clark's four academic strands. One student said she had felt "quite dumb" around computers; after Tech Lit she realized that "computers are not all that bad," and went on to take an AP Computer Science course. A freshman at the California Institute of Technology, she realizes that "all well-paying jobs require at least some degree of computer competence. I'm glad that I had the opportunity to take these courses [at Clark] that prepared me for computer use in college and in my future career." Clark faculty refer to Tech Lit as the "great equalizer." "Even if some kids come to Clark thinking they know computers, all students finish 9th grade really knowing technology applications."

## Block Schedule

Clark uses a block schedule. Most classes meet every other day for 90 minutes. Entering freshmen learn how to manage their time and homework assignments in the every other day course schedule. These management skills transfer easily to college and the workplace.

Teachers have been specifically trained in instructional strategies for the 90-minute block and report that block scheduling gives them time to “jigsaw” different learning opportunities: direct instruction, student presentations, student collaborative work, and class discussions. Principal Dall says he sometimes recruits teachers with elementary school backgrounds because they adapt easily to the 90-minute teaching periods and the school’s project-based instructional approach; teachers hired by ROP from business and industry appreciate the long teaching period for hands-on technology and science projects. All Clark teachers are certified in their content areas.



Clark’s teachers use the block scheduling in different ways. In one Tech Lit class, students downloaded images from CDs, the Internet, or digital cameras to illustrate vocabulary words, consulting with a peer or the teacher when necessary. In a small-business class, students learned how a laser engraver works, then wrote business plans and worked in teams on production, marketing, accounting, website development, and sales for an imaginary business. In another Tech Lit class, after doing research on a topic of interest on the Internet, students created newspaper articles with columns and pictures. A history and English teacher shared a 90-minute block, meeting every day, and co-taught a double class (with more than 60 students). The teachers “chunk” instruction into 10-15 minute increments that meet state standards for both English and history. Daily activities include vocabulary and oral language, lectures to extract meaning from homework assignments, and group or individual work on long-term projects.

### Enrichment and Networking Time

Two daily features are built into the block schedule: Enrichment (35 minutes at the end of each day), and a common snack and lunch period. During Enrichment, all teachers are available for extra help; some students are requested to attend Enrichment for identified reasons; others get a pass to go to see a teacher if they have questions. Students who don’t need or want extra help during Enrichment Period use this time for extracurricular clubs, attending Distinguished Speakers presentations, or participating in intramural sports and other enriching activities.

Every morning from 9:30 to 9:45, students can visit several outdoor snack locations, and all students have a common lunch period from 11:20-11:50 a.m. These common food periods intentionally give Clark students time to discuss course work, projects, and just hang out together.

By design, Clark is a closed campus. At 3 p.m., buses leave for the long rides home, some as long as 45 minutes—time which some students use to make friends. Clark has no team school sports, cheerleading, ROTC, or band; however, students can return to their neighborhood high schools for such activities after the final block. About 150 students do so. A large intramural program gives non-team sports students the competitive experience during several different intramural tournaments.

### “Can-do” Culture

Clark is a non-departmentalized high school, and faculty, explained Principal Dall, must be able to collaborate to plan an integrated curriculum aligned with California standards and to work with



students on performance-based projects. They fit into Clark’s “can-do” culture, he said. In addition to industry professionals, funded by ROP dollars, he looks for elementary school and middle school teachers since they are high energy, often trained in teaching to multiple intelligences, and they know how to “chunk” learning in 15 minutes activities. Veteran Clark teachers mentor new teachers in being accessible to students, planning as team members, and developing effective content-area lessons.

Teachers and students described Clark as a community built on trust and respect. There’s a sense of “oneness,” a teacher said. Principal Dall looks to hire “nice” people: “They make the best teachers. We can get them certified and teach them how to use technology... positivity is infectious,” he continues, “A teacher sets the tone for 30 kids and these 30 kids each affect another 30 kids.” Dall models student-centered learning by asking his teachers, “What can I do to help you do what you need to do?” His most important responsibility as principal, he said, is to decide, after two years, if a teacher merits tenure. “I really need to know each teacher and know how they work with students and their peers.” Not all teachers can do this, he admits. As a requirement of permanent employment status, all faculty become certified teachers in their subject area and have met district requirements for additional certification in multicultural education.

His faculty describe Dall as the “divine administrator,” always looking for the “right person” or the “next deal.” When a problem occurs on campus, Mr. Dall calls a “tune-up” meeting with the whole school in the outdoor amphitheatre. It lasts only 10 minutes, he said: “We articulate the problem, get input, decide on a plan, and do it.” This kind of

transparency is reflected in the all-glass walls of his office, designed to give him a clear view down two hallways. The vice-principal's office is also walled in glass.



Teachers and students are always in conversation; e-mail keeps faculty, counselors, students, parents, and administrators in touch. Grade-level teams meet regularly to plan curricula integration and discuss students. Teachers encourage students, offering positive feedback for their participation in class. The nurturing classroom climate and the constant use of technology in the classroom motivates

students' engagement and knowledge transfer. For example, students use what they learn in their computer applications and digital arts courses in presentations and projects in science, English, and history.

### **Data-Driven Instruction**

Data Director, a district-owned software program, gives teachers detailed student test results based on curriculum standards and test items. A student performing below proficient level will trigger a range of responses: differentiated instruction in the classroom, peer tutoring, supervision by the guidance department, or extra help during Enrichment. Guidance personnel contact parents early when a student appears to be having trouble. All parents are sent progress grades every five weeks. The Student Study Team, composed of guidance counselors, assistant principal, English language development specialist, and other concerned faculty, meet as necessary, but usually only three or four times a year, to review data on students who might need additional support. The administration works with students at the "tipping point"—just below proficient—to help them reach proficiency by the next marking period.

### **English Learners**

Students coded as needing additional English Language Development (ELD) classes also do extremely well at Clark, in part because they are treated as needing English language support, not as having learning deficits, in part because the school provides programs to meet their English language learning needs.

About 15% of Clark's students each year are classified as English learners (EL) and spend a year or two progressing through the school English Language Development (ELD) classes. Most EL students have high literacy skills in their native language and progress out of ELD in one year. Clark's student body is so ethnically diverse that EL students

are not readily identified. Teachers hold all students to high standards and remarked that they do not know who the EL students are.



Clark's ELD teacher specialist gathers student test data from their middle schools and plans a course schedule with the student and his or her parents. The schedule likely includes an ELD reading class as well as a class focused on writing, which replaces the grade-level English language class. Students at different ELD levels may work in small groups with teaching assistants. At the same time, EL students attend other core classes (technology, math, science, etc.) at their grade level, and transition out of the ELD courses when they test out of the program and can understand content-

area material. The ELD specialist keeps in touch with the classroom teachers in case there is need for further intervention. Literacy for Success is an extra class for all students who need additional help in reading comprehension and for EL students transitioning to the mainstream in language arts.

Clark's active, project-based learning approach suits non-native English speakers, giving them (and other students) opportunities to master real-life skills for career development while working in a collaborative environment. Active classroom learning allows all students, regardless of English language skill, to apply knowledge and demonstrate higher-level thinking skills. Technology, science, and math courses cross the language divide by employing universal concepts and theories, so that EL students can still be successful. Clark's emphasis on presentation skills gives EL students incentives and further practice in using English. Mainstream teachers have also been trained in "specially designed academic instruction in English," (SDAIE) which uses white boards, graphic organizers, illustrations, posted vocabulary words, among other visual aids. Computer repair, website design, and animation courses are well suited to these strategies. Finally, project assessments take students beyond paper and pencil tests and allow them to demonstrate proficiency in other ways.

### **Project-based Learning**

Clark's project-based learning supports the school's philosophy of connecting learning to real-world applications and employment skills. Teachers see themselves as facilitators, not instructors, and a student explained, "We sit at tables and learn to work with others. There needs to be compromises but you feel responsible for your own table's

presentation. This school is advanced in so many areas." In one hallway, walls displayed recent 9th grade student essays, modeled on the "My Turn" column in *Newsweek*, and so carefully written and formatted they were nearly indistinguishable from the actual magazine. In the combined 10th grade history and English class, honor students are integrated with regular education students, although they receive different assignments based on the same content area. Teachers strategically rotate all students to new groups every 3-4 weeks. During the site visit, the student assignment was doing an oral history of an elder on the topic of "The Greatest Change in my Lifetime" which was connected to essays from an historical text the students were studying.

Special Clark programs include Environment and Spatial Technology (EAST), Robotics, and Senior Projects. Principal Dall hired a young female marine biologist to be a role model for female students and to teach EAST, a junior-level course which uses geographic information and positioning systems and soft-imaging, animation, and computer-aided design software to design environmental projects that benefit the community. Currently the EAST class is conducting a study of heavy metal contamination in Los Angeles harbor, aiding law enforcement officers in criminal investigations who have to work in the contaminated water. "I know our students are doing important research when the FBI Dive Team calls to look at our findings," said Dall. EAST culminates in a trade show where students present their findings.



Engineers from the nearby Jet Propulsion Laboratory teach Robotics, an elective ROP class. Designing and building their own robots, Clark students compete in an annual regional competition. This year's robotics season highlights included a win at the San Diego Regional FIRST (For Inspiration and Recognition in Science and Technology) Robotics competition and a trip to Atlanta, GA to participate in the international robotics finals.

Clark's antidote to "senioritis" is a Senior Project, completed in the spring of student's senior year. All faculty and many community members participate, mentoring students, judging presentations, and reading student essays. Working individually but with mentors, students choose a career, hobby, or academic interest and must



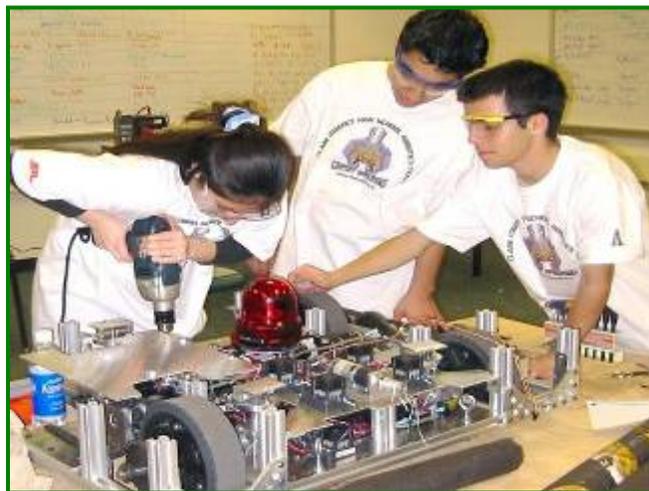
complete at least 15 hours of fieldwork, a 6-8 page research paper, a portfolio documenting the course of the project, a tangible product such as a book, model, website, or physical demonstration, and a final presentation. Mentors support seniors but sign an agreement "not to do the work for the student" but "guide, answer questions, and give advice as needed," simulating an work situation. Many seniors partner with outside businesses or pursue a career interest, which often leads to employment later.

In June, seniors present their projects before a panel of judges from the community. Rubrics guide faculty and community members in scoring the portfolios and student essays and judging presentations. In 2006, senior projects topics ranged from obtaining a real estate license and practicing the trade and developing a business plan for a tea room, to writing a medical billing training manual, coaching a basketball team for middle school students, and beginning a career in child care.

### Rigorous and Relevant Curriculum

Each student takes seven classes a year and must graduate with four years of English, math, and science, and at least two years of history and Spanish. One semester of economics and government is also required for all seniors, and physical education is required for four semesters.

From the beginning of the school, most 9th grade students have enrolled in a conceptual physics course that is backed up by school reform research data as an excellent foundation course for future science classes. When the State of California tested a myriad of subjects under the Golden State Exam program, Clark's 9th grade physics students scored better than the average 12th grade physics students at more typical California high schools on the Golden State Physics exam. Conceptual chemistry, and conceptual intermediate algebra, courses



have been recently added to help students who are not strong in math to learn content through concepts rather than formulas; such courses gives students another year of math and science and eases their move to the next level. Students also take career-oriented courses such as basic network design, e-marketing, digital photography, computer animation, and small business, along with rigorous core academic courses.

All Clark students are encouraged to take Advanced Placement (AP) classes; while students earn additional grade points for taking AP courses, they also build skills and gain experience and confidence in AP course work even if their AP test scores are not high. A remarkable aspect of Clark's AP program is the fact that a higher percentage of

Clark students attempt such classes than might be the case at a typical California high school. The school's culture encourages enrollment in higher level math and science classes, for example approximately 10% of the school's students enroll in AP Calculus.

## Student Population

Clark's small personalized learning environment is attracting more special education students and students from immigrant neighborhoods. Once a couple students from a neighborhood attend Clark and are successful, siblings and cousins follow. In addition to accommodating a large Armenian population (approximately 60% of the student body) Clark is striving to more closely match the profiles of other high schools in the district by recruiting more African American, Hispanic, and female students.

Administrators, teachers and students visit area middle schools to clarify Clark's mission, which not (as is popularly understood) to skim the cream of the district's middle school students but give students opportunities they might not otherwise have. Clark is an alternative for students interested in science and technology who might not get that focus in their home high school. School leaders are working with personnel from the feeder middle schools in order to recruit students who would benefit from the Clark Magnet instructional approach.



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## Teaching Faculty

The key to sustainability, the principal Dall says, is hiring young and versatile staff, likening his process to "seed[ing] a tennis tournament." As the top seeds retire, younger talented faculty must be ready to take their places. Many teachers request work at Clark, but Clark faculty must be committed to personalized instruction, be comfortable with performance-based learning, and teach using an integrated curriculum in a block schedule. Administrators at Clark remind visitors that a high school is like working in a business. "With a little ingenuity," Principal Dall affirms, "anything is possible."

## Keeping the Mission First

The annual Founder's Day celebration exemplifies Clark's commitment to rigorous and relevant curriculum that connects school and career. Students attest that science and technology, at the core of Clark's mission, are

foundational skills that they use in college and in their careers. The administration is constantly challenged to look beyond the campus for collaborative opportunities to support this mission while the faculty continues to work collaboratively with students to accomplish its mission.

<b>Based on California High School Exit Exam, Grade 10</b>				
<b>% Proficient or Above English/Language Arts</b>				
	2002-03	2003-04	2004-05	2005-06
All	81%	86%	87%	84%
Socio-Economically Disadvantaged	77%	77%	80%	68%
Limited English Proficient	73%	82%	76%	64%
<b>% Proficient or Above Math</b>				
All	82%	89%	87%	90%
Socio-Economically Disadvantaged	75%	83%	84%	78%
Limited English Proficient	74%	82%	76%	81%

