

**MINUTES OF  
THE EDWARDS COMMUNITY ALLIANCE  
MEETING  
JULY 21, 2008**

President Deaver opened the meeting at 8:00 AM. Directors in attendance: Deaver, Edmiston, Jamison, Layne, Painter, Pickard, Scott, Uhazy, Welling, Williams. Others present: Johnstone, Jung, Witt

**ECA PROJECT STATUS**

Land Use Compatibility: James Welling-No new issues.

Education: The Board of Trade is planning on conducting a second dialogue on higher education. This dialogue will most likely be held after the elections in November and will focus on getting the region to work together to bring a comprehensive, polytechnic university to the region. In addition to special speakers, the dialogue will conduct four workshops; Student Success—Meeting A-G Requirements, Legislative Support, Local Government Engagement, and Private Sector Support. The goal of the workshops is to lay out a plan for collaboration and how to meet the CSU student requirements. The planning committee is looking for potential key note speakers. One plan is to have a well-known speaker as a draw for good attendance. Another suggestion is to have someone from a high-level education position that can address the needs of a university. President Deaver suggested Chris Piercy, Director of K-16 Bridge program in Victorville. Johnstone agreed Piercy would be a good choice and said he would bring up this suggestion to the committee.

**FINANCIAL REPORT**

James Welling said the checking account balance as of July 18 is: \$20,039.63. Kern County is trying to save money for next year and has asked ECA to take a cut in the budget. The consensus was a reduction is possible and the new budget should concentrate on education.

**OPEN DISCUSSION**

Governor's Visit: Stu Witt said the Governor's Office has rejected the invitation to attend the White Knight II roll-out next Monday. This means there will be no EKERN meeting to discuss education and the four year university with the Governor. New Mexico is sending a delegation to attend this major media event.

Math and Science: Gateways to California's Fastest Growing Careers: See attached article.

Math and Science Education for the California Workforce: See attached article.

Mojave Airport Update: Mr. Witt gave a brief update on Mojave Airport. A new rail spur has been added to service tenants. The Civilian Test Pilot School is building a new, large hangar for their operation. Northrop-Grumman is now the largest tenant at the airport. In the last 10 years there have been 4, 200 rocket tests at the airport.

The meeting adjourned at 8:50 AM.

The next meeting will be on August 18<sup>th</sup> at Mojave Airport.

Sincerely,

Robert Johnstone

Technical Advisor

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## Math and Science: Gateways to California's Fastest-growing Careers

**SOME STUDENTS—AND PARENTS—THINK MATH** and science are not too important for their future. But as everyday life becomes more dependent on technology, most people will need a better background in math and science to succeed in today's global economy. And to get high-paying jobs in some of California's fastest-growing occupations, a strong background in math and science is a must.

This Q&A discusses what students need to do today to prepare for tomorrow's jobs.

### What are the fastest-growing jobs in California today?

The state Employment Development Department (EDD) predicts that jobs in health care, computers, and teaching will grow rapidly in the near future. That means that there are likely to be many job opportunities in these fields.

Some of these jobs will require only on-the-job training, but others will need at least a four-year college degree. In general, the more education a job requires, the higher the pay. Increasingly, workers need education and training after high school to earn a living wage.

### What opportunities exist in the medical field?

Health care offers a wide variety of jobs that vary significantly in both the education required and the salary level. For all these careers, an interest and background in math and science is particularly valuable.

Some of the fastest-growing and best-paying jobs in the medical field, such as physician assistant, require at least a four-year bachelor of science (BS) or bachelor of arts (BA) degree. But others, such as nursing, require only a two-year associate of arts (AA) or associate of science (AS) degree. (See the table on the right.) EDD reports that registered nurses are the seventh most in-demand job in California. Students can also choose to get a bachelor's degree in nursing. Completing a four-year program often opens up more and better-paying opportunities in the nursing field.

Pharmacy technicians and dental assistants are two in-demand jobs that require about a

### Some of the Fastest-growing Jobs in California, 2004 to 2014

Fast-growing Jobs	Average Annual Wage, May 2006	Typical Education & Training Levels Required
<b>Medical/Health Care Jobs</b>		
Physician Assistants	\$80,960	BA/BS Degree
Medical Scientists	\$78,790	PhD Degree*
Registered Nurses	\$75,130	AA Degree
Dental Hygienists	\$73,950	AA Degree
Pharmacy Technicians	\$34,320	1 Year or Less of Training
Medical Records and Health Information Technicians	\$34,200	AA Degree
Dental Assistants	\$32,170	1 Year or Less of Training
Medical Assistants	\$30,960	1 Year or Less of Training
<b>Computer Technology Jobs</b>		
Computer and Information Systems Managers	\$120,800	BA/BS Degree + Experience
Computer Software Engineers, Systems Software	\$96,070	BA/BS Degree
Computer Software Engineers, Applications	\$91,590	BA/BS Degree
Computer Systems Analysts	\$76,970	BA/BS Degree
Database Administrators	\$74,150	BA/BS Degree
Network and Computer Systems Administrators	\$72,680	BA/BS Degree
Network Systems and Data Communications Analysts	\$71,870	BA/BS Degree
Computer Support Specialists	\$50,100	AA Degree
<b>Teaching</b>		
Teachers	\$59,825	BA/BS Degree + Training†

DATA: CALIFORNIA EMPLOYMENT DEVELOPMENT DEPARTMENT (EDD), U.S. BUREAU OF LABOR STATISTICS (BLS), NATIONAL EDUCATION ASSOCIATION

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year of training. Sometimes employers offer on-the-job training, but often they require a certificate from a community college that takes a little less than a year to earn. Community colleges also offer two-year associate degrees in these fields, which typically give students more opportunities for better-paying jobs.

### What are some of the most in-demand jobs in computer technology?

The growing computer technology field also offers a wide range of career choices. (See the table.) In particular, computer software engineering will offer plentiful jobs in the near

future, according to EDD. Such jobs usually require at least a four-year degree, and those degrees include academic work in math.

However, some computer jobs require only a two-year degree, though most expect some knowledge of math. For example, computer support specialists—who help maintain the tools and information systems that others create—generally need an associate's degree.

### Will California continue to need teachers?

The state expects to need teachers at all levels—from elementary, middle, and high school to technical training, college, and university.

Demand is particularly strong for math and science teachers at the middle and high school level. Scholarships and other incentives are increasingly being used to attract and keep math and science teachers. (See the table on page I for salary and education information.)

#### *What can students do today to make sure they are well prepared for tomorrow's job opportunities?*

Students need a well-rounded education, which includes English, social sciences, and the arts as well as math and science. Besides basic education skills, employers also look for workers who can:

- Solve problems creatively;
- Work in a team;
- Communicate well (are active listeners);
- Set attainable goals; and
- Continually learn in a changing workplace.

California employers often see college graduates as more likely to have these important skills than job applicants who have not gone to college.

#### *A background in math and science offers more possibilities*

In addition, a solid education in math and science provides students with more opportunities at every level. Becoming an electrician or an auto mechanic, for example, requires math and technical skills. Medical assistants need a basic background in biology and chemistry.

#### *High school preparation is key to success in community college*

If students want a higher-paying job, they typically must earn at least an associate's degree. And being well prepared in high school is critical to succeeding in community college.

For example, community colleges expect students to pass a placement test in Algebra II before enrolling. If they don't pass the test, they must take remedial math for no credit before they can enroll in college-level math and science courses. In general, students who are well prepared in high school math are more likely to succeed in college no matter what field they choose.

#### *Four-year universities require a solid math and science background*

To be accepted by one of the state's four-year universities, students need to take at least three years of high school math (Algebra I, geometry, and Algebra II) and two years of laboratory science (biology and either chemistry or physics).

But meeting this minimal standard may not be enough. Many universities expect entering freshmen to have taken additional rigorous courses. To have a better chance of getting into the university of their choice, students are encouraged to take four years of math and three to four years of science in high school, including honors courses such as advanced placement (AP) or international baccalaureate (IB) classes. This rigorous curriculum makes students more competitive even if

their goal is to major in subjects such as English, history, business, or the arts.

#### *Do students need to be concerned about these issues before they enter high school?*

Parents of younger students need to be aware of the math and science background that their child is receiving in elementary and middle school. To get on the most advanced path to college, students ideally need to be ready to take and successfully complete Algebra I in eighth grade. Those students are in a position to take more high-level math courses in high school. In addition, generally students who complete Algebra I in eighth grade also take higher-level science courses earlier.

#### *What if a student does not take Algebra I until ninth grade?*

More California students take Algebra I in ninth grade than in eighth grade. These students can still complete high-level math courses—including an advanced math course in their senior year.

#### *What can students do to make sure they are taking the courses that they need?*

It is important for students to talk to their school's guidance counselor. Parents of sixth graders should ask if their child is on track to take Algebra I in eighth grade.

In high school, it is important for students who want the most opportunities when they graduate to enroll in math and science courses for all four years. Some schools that do not offer a large number or a wide variety of advanced math and science courses allow students to take such classes online through distance learning courses that are paid for by the school. Students may also take these courses at community colleges while in high school—in some cases, through special programs set up between the colleges and their high school.

If a school does not have a guidance counselor, students and their parents should meet with the assistant principal or other staff member who is responsible for class assignments. [?]

#### *How can I find out more?*

For information on the state's postsecondary institutions, go to:

[www.ucop.edu](http://www.ucop.edu) for the 10 campuses of the University of California (UC). The UC system draws from the top eighth of public school graduates. It offers bachelor's, master's, and doctoral programs and prepares professionals in fields such as medicine and engineering.

[www.calstate.edu/dastore/admissions.shtml](http://www.calstate.edu/dastore/admissions.shtml) for the 23 campuses of the California State University (CSU) system. CSU plays a big role in preparing California teachers and also graduates a number of computer scientists, engineers, and medical personnel.

[www.cccco.edu](http://www.cccco.edu) for the state's 109 community colleges. These colleges provide vocational programs, such as nursing and database management, and also prepare students for four-year universities.

For a state-recommended, grade-level reading list in math and science literature for kindergarten through 12th grade students, see [www.cde.ca.gov/cl/sc/](http://www.cde.ca.gov/cl/sc/) and click "Recommended Literature for Math & Science."



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## Math And Science Education for the California Workforce: It Starts with K-12

**TOMORROW'S WORKFORCE IS IN CALIFORNIA'S** public schools now. How well these students are educated in math and science will help determine the quality of not only their lives, but also the state's future.

Jobs in math and science fields that require postsecondary degrees are prominent among the state's fastest-growing occupations. Some fields, such as computer software engineering, are also expected to offer large numbers of job openings.

Occupations in computer science fields tend to require at least a bachelor's degree and sometimes work experience. More secondary school teachers, who hold a degree and a credential, are also needed, particularly in math and science. A 2007 study found that about 10% of California's high school math and science teachers are underprepared (do not hold the proper credentials), especially in low-performing schools.

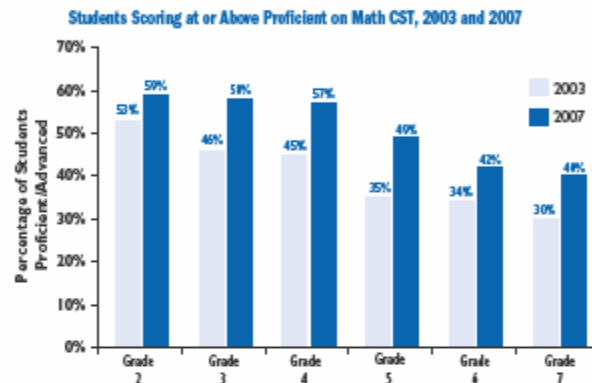
In addition, some fast-growing jobs that require math and science backgrounds—such as computer support specialists, health information technicians, and registered nurses—require at least an associate's degree from a community college. Projections also show that many California jobs will require less education—and pay lower wages—including retail salespersons, cashiers, waiters, and office clerks.

These projections make clear that education—including a strong background in math and science—plays an important role in determining students' future opportunities and earnings. That reality was one impetus for California's adoption in the late 1990s of rigorous academic content standards in both math and science.

### *More students are prepared for high school math, though challenges remain*

In 2000 California policymakers made the completion of Algebra I a mandatory requirement for a high school diploma. The move followed the adoption of a new set of K-12 academic content standards in math that recommended students take the course in 8th grade, a path previously reserved for only the highest-achieving students.

**figure 1** Proficiency on math CSTs before high school tends to decline across grades but has improved at each grade level



Although the percentage of students who score proficient or above in math each year tends to decline from 2nd to 7th grade, all grades show steady improvement between 2002-03 and 2006-07.

DATA: CALIFORNIA DEPARTMENT OF EDUCATION (CDE)

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Achievement data from the California Standards Tests (CSTs) for grades 2-7 indicate the extent to which students are prepared to take Algebra I in 8th grade. As Figure 1 shows, as students get older, they are progressively less likely to score proficient or above. But the percentage of students scoring at least proficient on these CSTs has been increasing steadily across all grades since 2002-03.

CSTs for grades 2-8 and 10th grade scores on the California High School Exit Exam (scores that are reported to the federal government) also show that math proficiency has increased for all student subgroups. However, large differences in proficiency exist among them. At the extremes, almost 77% of Asian students demonstrated proficiency in math compared with about 31% of African American students.

### *More students are taking Algebra I*

The number of California 8th graders taking Algebra I has increased greatly since the state explicitly recommended the course be

completed in 8th grade—from 16% in 1999 to nearly half in 2006-07. However, the rates of participation vary based on ethnicity. In 2006-07, the following percentages of students took Algebra I in 8th grade:

- 61% of Asian and Filipino students;
- 52% of white students;
- 46% of both African American and Hispanic/Latino students (but their rates of participation greatly increased);
- 43% of Native American students.

Although more 8th grade students are taking Algebra I than before, students still more often take Algebra I and subsequent math courses one year behind the state guidelines. These students, if successful, may complete Algebra II in 11th grade. (See Figure 2 on page 2.)

### *Students on the standards-aligned path tend to score proficient at higher rates*

Students who take Algebra I in 8th grade tend to score proficient or advanced at higher rates than their peers on other paths. Of students

**Figure 2 Overall, high school math course-taking has increased and accelerated, but the most common schedule includes Algebra I in 9th grade**

Subject Area	8th Grade	9th Grade	10th Grade	11th Grade
General Math 2007 (2003)	45% (60%)	17% (32%)		
Algebra I 2007 (2003)	49% (32%)	52% (37%)	28% (25%)	
Geometry 2007 (2003)		22% (16%)	31% (26%)	18% (15%)
Algebra II 2007 (2003)			21% (15%)	24% (20%)
Summative High School Math* 2007 (2003)				20% (15%)

■ Standards-aligned Path ■ Typical Path ■ A Year Behind the Typical Path

The percentage of students in each grade taking high school math courses according to the state's recommended timetable (beginning in 8th grade) has increased since 2002–03, but larger percentages of students still take math courses a year behind that schedule (beginning in 9th grade). The proportion of 8th and 9th graders taking a course in General Math has decreased.

\* Taken by high school students (excluding 12th graders) who had completed Algebra II the previous year.

Data: CALIFORNIA DEPARTMENT OF EDUCATION (CDE)

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who took Algebra I in 2006–07, 38% of 8th graders scored advanced or proficient on the CST, compared with 17% of 9th graders and 8% of 10th graders.

Overall, more students are now taking Algebra I in 8th grade, more are scoring proficient and advanced, and more students have the opportunity to take advanced math courses. But many California students still struggle with the subject.

**Science course-taking and achievement have improved, but the data are more difficult to analyze**

Unlike with math, the state does not recommend a particular science course sequence for high school students. More California students are enrolling in biology, chemistry, and earth science, and student achievement in these courses generally improved between 2002–03 and 2006–07:

- **Biology:** Enrollments increased from 334,000 in 2002–03 to 507,000 in 2006–07, and proficiency increased slightly

among 9th and 11th graders (but fell slightly among 10th graders).

- **Chemistry:** Enrollments increased from 153,000 to 228,000; proficiency was the same for 10th graders and increased slightly for 11th graders.
- **Earth Science:** Enrollments increased from 90,000 to 207,000 with most students taking the course in 9th grade; proficiency increased slightly in all grades that were tested.
- **Physics:** The proportion of students who study physics (usually in 11th grade) has not changed much since 2002–03. Proficiency tends to be highest among 11th graders who take the course.

**Data offer a partial picture of the state's highest-achieving students in math and science**

Many high-achieving students pursue upper-level math and science courses in high school. In math, 14% of students enrolled in an advanced course such as

**Student-level data show a relationship between science and math course-taking**

An analysis of 2005–06 student records by the California Department of Education (CDE) reveals that students who had completed Algebra I in 8th grade and were taking geometry in 9th grade were more likely to also take "college prep" science (i.e., biology) than their peers who took Algebra I in 9th grade. And science courses were less likely to be "college prep" among those students who were not yet taking Algebra I by 9th grade. Because many higher-level science courses require a certain level of math proficiency, these data demonstrate how Algebra I may serve as a gateway to a more rigorous high school science education.

trigonometry, statistics, or calculus in 2006–07. In addition:

- Nearly 109,000 students (primarily 11th graders) took the Summative High School Math CST in 2006–07 (compared with almost 77,000 in 2002–03), and the percentage who scored proficient or above increased slightly. This test is taken the year following completion of Algebra II.
- In 2007 California students took 129,661 AP exams in math, science, and technology subjects, and about 60% received a passing score.

**Math and science education are key to the state's future**

In a society that is increasingly technological and in a state with an economy that depends so heavily on math and science, these two subjects should represent opportunities for California students rather than the barriers that they often have been. This is particularly true when these barriers contribute to inequalities based on students' racial, socioeconomic, or gender backgrounds. Every student who leaves a California high school with a strong foundation in math and science will be better prepared to participate in California's changing economy. ☐☐

To see the full EdSource report that this brief summarizes, go to: [www.edsource.org/pub\\_adv\\_mathscience0108.cfm](http://www.edsource.org/pub_adv_mathscience0108.cfm)

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