EdSource Clarifying Complex Education Issues®

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 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.

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

Fast-growing Jobs	Average Annual Wage, May 2006	Typical Education & Training Levels Required
Medical/Health Care Jobs		
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
Computer Technology Jobs		
Computer and Information Systems Managers	$120,600	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
Teaching		
Teachers	$59,825	BA/BS Degree + Training†

* To earn a PhD, students must first complete a four-year degree and then go to graduate school, do research, and write a dissertation.
†Teachers generally work fewer weeks per year than other professionals.

Data: California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS), National Education Association — EdSource 1/08

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 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/datastore/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 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/ci/sc/** and click "Recommended Literature for Math & Science."

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