dropping math?

say goodbye to almost 100 *careers*

3 *without a* minimum of years of math, *say goodbye to:*

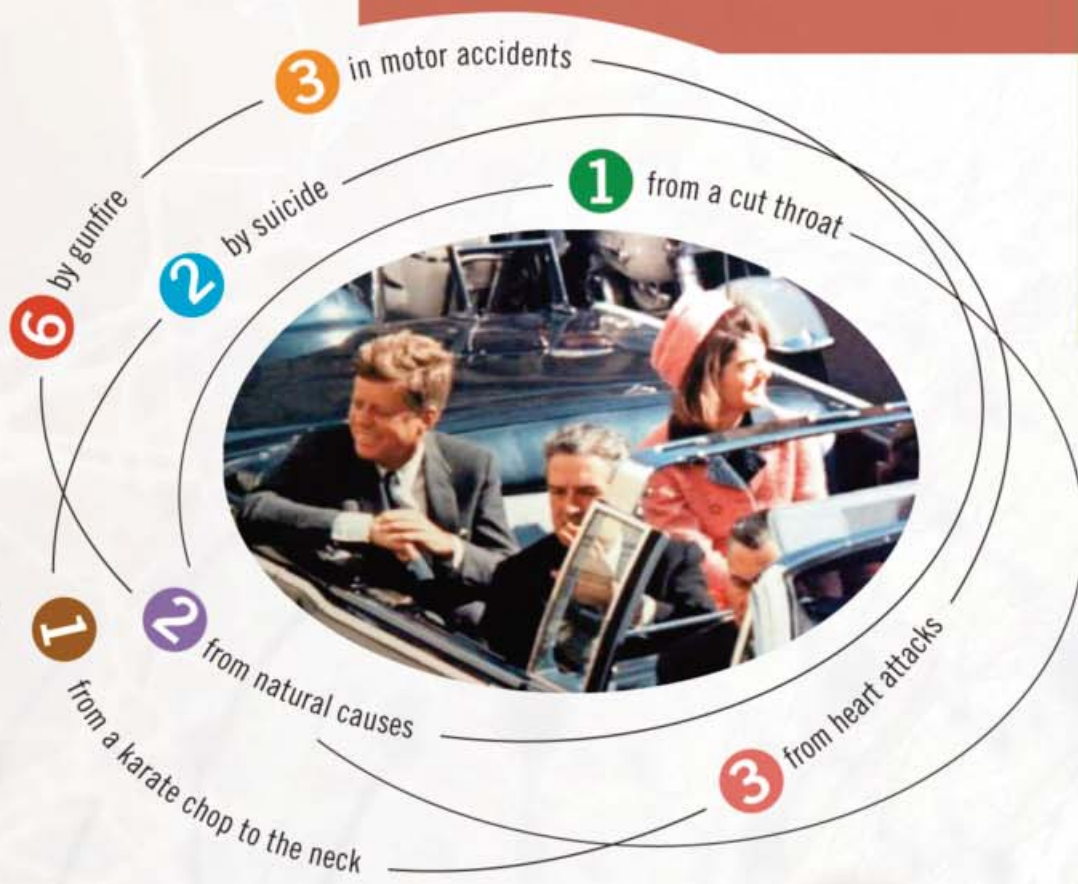
- agricultural technician
- animal care technician
- audiologist
- bookkeeper
- cartographer
- cartography technician
- commercial driver
- computer technologist
- dental assistant/ technician
- drafter
- electronics technician
- elementary school teacher
- engineering technologist
- executive assistant
- farm equipment mechanic
- forestry technician
- geographer
- health records administrator
- horticulturist
- industrial designer
- landscape technician
- lawyer
- medical equipment maintenance technologist
- meteorological technician
- nuclear medical technologist
- occupational therapist
- ophthalmic assistant
- pharmacy assistant
- physical therapist
- property appraiser
- psychologist
- public health inspector
- public health nurse
- real estate agent
- registered nurse
- respiratory technologist
- sociologist
- speech therapist
- sports administrator
- stock broker
- survey technician/ technologist
- tool and die maker
- urban planner
- welder
- X-ray technician

3+ *without a* minimum of years of math, *(and preferably more) say goodbye to:*

- audiologist
- cartographer
- elementary school teacher
- engineering technologist
- executive assistant
- geographer
- health records administrator
- lawyer
- nuclear medical technologist
- occupational therapist
- physical therapist
- property appraiser
- psychologist
- real estate agent
- registered nurse
- sociologist
- speech therapist
- stockbroker
- survey technologist
- urban planner

An actuary

looks at data to identify trends and changing patterns in behavior. Example? In the three years following the murder of President Kennedy and Lee Harvey Oswald, 18 material witnesses died:



An actuary hired by the London Sunday Times concluded that on November 22, 1963, the odds against these witnesses all being dead by February 1967 were 100,000,000,000,000 (one hundred thousand trillion) to one. How could he know? An actuary looks at data to identify trends and changing patterns in behavior. This guy used calculus, probability, and statistics to determine the astonishing odds concerning the deaths of the material witnesses to the Kennedy assassination. When he wasn't following the conspiracy theory, he worked for an insurance company. In that capacity, he probably helped develop insurance policies based on the likelihood of people living to a certain age or developing certain diseases.

high tech:

today's growth = tomorrow's boom

Job growth for computing professions can be summed up in one word: **big**. Computing occupations are estimated over the next decade to grow between 23% and 53%, far outpacing overall job growth across the country. Example? The number of online help-wanted ads for robotics experts shot up 40% in the first two months of 2012 alone, according to the research from Wanted Analytics.

Want in? A credential in a computing major will open the door. And you don't need a four-year engineering degree. Basic robotics skills can be learned in a "mechatronics" program, which usually takes two years to complete at a college or trade school.

For two-year and four-year computer programs in Vermont, visit **www.vtcolleges.org** and click on "Search by Major" in the menu bar along the top. Don't limit yourself to the Computer Engineering and Technology categories: Identify three other categories that offer computer-related programs and majors. *

*Answers: *Arts, Business, Communications, Health, Science.*

4 *without a* minimum of years of math, *say goodbye to:*

actuary (see page 1)
animator
archeologist
architect
astronaut
astronomer physicist
biologist
business administrator
certified public accountant
chemist
computer game designer
computer scientist
cryptologist
dentist
doctor
ecologist
economist
engineer
financial planner
forensic scientist
forester
interior designer
landscape architect
mathematician
mathematics teacher
medical lab technologist
metallurgist
meteorologist
operations research analyst
optometrist
pharmacist
research scientist
robotics engineer
roller coaster designer
special effects director
sports announcer
statistician
surveyor
veterinarian

what the who?

Four years of math may sound like a drag, but the work you get to do as a result may make it worthwhile.
Match the creative or adrenalin-pumping descriptions below to one of the specialists within the list on the left.

1 I use math to rotate, shift, and enlarge images for film, game development, television, broadband Internet, broadcast and Web advertising, education, research, and military training.

2 I foil hacktivists by using mathematical theorems and formulas to encode, encrypt, and devise systems that protect companies and consumers.

3 I'm the one with the latex gloves who figures out when the blood was shed, what type of weapon was used, and the impact that caused a victim's injury.

4 I measure the world. I look at things like gravitational pull, tectonic plates, and the rotation of the earth to determine how fast a glacier is melting or whether the continents are spreading apart.

5 When I'm moving at 700 mph, I need to be able to calculate direction and speed of wind, and how much fuel I have left — all on the fly (excuse the play on words).

6 I create hair-raising downhill plunges by using the mathematical properties of curves, in addition to physics, kinematics, and material strength.

7 Powerful computing equipment, numerical methods, and algorithms help me turn up the WOW factor in the visual effects industry.

8 My play-by-play commentary includes numbers: percentages, stats, and timing — all done live, which means no room for error.

9 Intrigued by Web analytics? Work with me! I live to study numbers and patterns to figure out how people are using the Internet.

10 My work involves hardcore numbers that create killer Gooples, star-throwing ninjas, and more. The theory I use every day involves a branch of applied mathematics, in addition to trigonometry, physics, and calculus.

Answers: *1, animators; 2, cryptologists; 3, forensic scientists; 4, geodesists; 5, fighter pilots; 6, roller coaster designers; 7, special effects directors; 8, sports announcers; 9, statisticians; 10, game designers.*

Check out

just a few of the programs in which you can hone your skills in hands-on challenges that explore math-related careers. You'll meet peers from across New England, and you'll get to meet professionals from education and business (a great way to start your college and career network!).

Governor's Institutes of Vermont

www.giv.org/institutes

These are week-long summer learning opportunities on Vermont college campuses.

- Math Institute
- Engineering Institute
- Information Technology Institute
- Environmental Science and Technology Institute

Aiken/TASC Challenges

www.cems.uvm.edu/TASC

On a Saturday during the school year, teams of middle school and high school students compete for prizes in technology and science projects that explore sustainable engineering and technology. Past projects have included:

- designing a transportation vehicle powered by human energy that can deliver supplies and/or travel through courses
- creating a video related to alternative transportation

MIT's Splash program

http://esp.mit.edu/learn/Splash/index.html

On a full weekend in November, thousands of students flood the Boston campus of MIT (Massachusetts Institute of Technology) to take classes taught by undergraduates and other members of the MIT community. Check out classes on game theory or Bayesian Statistics (to calculate your odds of having a rare genetic disease, predict the weather, and track down Nazi submarines).

Not interested in math? Take a class on Egyptian mythology, Origami, chemical sensors, swing dance, Alfred Hitchcock's films, Hungarian history, or aircraft analysis. Check the Web site for more than 400 courses.