

## ***WHY YOU SHOULD CHOOSE MATH IN HIGH SCHOOL***

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[The following article was written for *Aftenposten*, a large Norwegian newspaper. The article encourages students to choose math as a major subject in high school – not just in preparation for higher education but because having math up to maximum high school level is important in all walks of life. Note: This translation is slightly changed to have meaning outside a Norwegian context.]

### *Why you should choose math in high school*

A recurring problem in most rich societies is that students in general do not take enough math – despite high availability of relatively well-paid jobs in fields that demand math, such as engineering, statistics, teaching and technology. Students see math as hard, boring and irrelevant, and do not respond (at least not sufficiently) to motivational factors such as easier admission to higher education or interesting and important work.

It seems to me we need to be much more direct in our attempts to get students to learn hard sciences in general and math in particular. Hence, addressed to current and future high school students, here are 11 reasons to choose lots of math in high school:

*Choose math because it makes you smarter.* Math is to learning what endurance and strength training is to sports: the basis that enables you to excel in the specialty of your choice. You cannot become a major sports star without being strong and having good cardiovascular ability. You cannot become a star within your job or excel in your profession unless you can think smart and critically -- and math will help you do that.

*Choose math because you will make more money.* Winners of American Idol and other “celebrities” may make money, but only a tiny number of people have enough celebrity to make money, and most of them get stale after a few years. Then it is back to school, or to less rewarding careers (“Would you like fries with that?”). If you skip auditions and the sports channels and instead do your homework -- especially math -- you can go on to get an education that will get you a well-paid job. Much more than what pop singers and sports stars make -- perhaps not right away, but certainly if you look at averages and calculate it over a lifetime.

*Choose math because you will lose less money.* When hordes of idiots throw their money at pyramid schemes, it is partially because they don't know enough math. Specifically, if you know a little bit about statistics and interest calculations, you can look through economic lies and wishful thinking. With some knowledge of hard sciences you will probably feel better, too, because you will avoid spending your money and your hopes on alternative medicine, crystals, magnets and other swindles -- simply because you *know* they don't work.

*Choose math to get an easier time at college and university.* Yes, it is hard work to learn math properly while in high school. But when it is time for college or university, you can skip reading pages and pages of boring, over-explaining college texts. Instead, you can look at a chart or a formula, and understand how things relate to each other. Math is a language, shorter and more effective than other languages. If you know math, you can work smarter, not harder.

*Choose math because you will live in a global world.* In a global world, you will compete for the interesting jobs against people from the whole world -- and the smart kids in Eastern Europe, India and China regard math and other "hard" sciences as a ticket out of poverty and social degradation. Why not do as they do -- get knowledge that makes you viable all over the world, not just in your home country?

*Choose math because you will live in a world of constant change.* New technology and new ways of doing things change daily life and work more and more. If you have learned math, you can learn *how* and *why* things work, and avoid scraping by through your career, supported by Post-It Notes and Help files -- scared to death of accidentally pressing the wrong key and running into something unfamiliar.

*Choose math because it doesn't close any doors.* If you don't choose math in high school, you close the door to interesting studies and careers. You might not think those options interesting now, but what if you change your mind? Besides, math is most easily learned as a young person, whereas social sciences, history, art and philosophy benefit from a little maturing -- and some math.

*Choose math because it is interesting in itself.* Too many people -- including teachers -- will tell you that math is hard and boring. But what do they know? You don't ask your grandmother what kind of game-playing machine you should get, and you don't ask your parents for help in sending a text message. Why ask a teacher -- who perhaps got a C in basic math and still made it through to his or her teaching

certificate -- whether math is hard? If you do the work and stick it out, you will find that math is fun, exciting, and intellectually elegant.

*Choose math because you will meet it more and more in the future.* Math becomes more and more important in all areas of work and scholarship. Future journalists and politicians will talk less and analyze more. Future police officers and military personnel will use more and more complicated technology. Future nurses and teachers will have to relate to numbers and technology every day. Future car mechanics and carpenters will use chip-optimization and stress analysis as much as monkey wrenches and hammers. There will be more math at work, so you will need more math at school.

*Choose math so you can get through, not just into college.* If you cherry-pick the easy stuff in high school, you might come through with a certificate that makes you eligible for a college education. Having a piece of paper is nice, but don't for a second think this makes you ready for college. You will notice this as soon as you enter college and have to take remedial math programs, with ensuing stress and difficulty, just to have any kind of idea what the professor is talking about.

*Choose math because it is creative\**. Many think math only has to do with logical deduction and somehow is in opposition to creativity. The truth is that math can be a supremely creative force if only the knowledge is used right, not least as a tool for problem solving during your career. A good knowledge of math in combination with other knowledge makes you more creative than others.

*Choose math because it is cool.* You have permission to be smart, you have permission to do what your peers do not. Choose math so you don't have to, for the rest of your life, talk about how math is "hard" or "cold". Choose math so you don't have to joke away your inability to do simple calculations or lack of understanding of what you are doing. Besides, math will get you a job in the cool companies, those that need brains.

You don't have to become a mathematician (or an engineer) because you choose math in high school. But it helps to choose math if you want to be smart, think critically, understand how and why things relate to each other, and to argue effectively and convincingly.

Math is a sharp knife for cutting through thorny problems. If you want a sharp knife in your mental tool chest – *choose math!*

<http://www.acm.org/ubiquity/>

\* This point was added by Jon Holtan, a mathematician who works with the insurance company If.