

Ten Reasons Why No Student Should Go Through High School Without Taking Physics

For most students taking a high school physics class is a challenge, but it's well worth the effort for the following reasons:

- 1. Most modern technology involves physics.** Any technology involving electricity, magnetism, force, pressure, heat, light, energy, sound, optics, etc. comes from physics. Even though the basic knowledge required for products like fertilizers, drugs, plastics, and chemicals comes from chemistry and biology, these items have to eventually be manufactured, and manufacturing is dominated by physics-based technology.
- 2. An understanding of physics leads to a better understanding of almost any other science.** Like technology, virtually all branches of science contain at least some physics. Physics has been called the most basic science and in many cases is required in order to understand concepts in other sciences. Physics sharpens skill at performing experiments, as does Biology and Chemistry. However, it differs in that most commonly used sensors are based on a principle of physics. This includes simple pressure and temperature measuring devices all the way to complex devices like mass spectrometers (used in chemical analysis), MRI imaging machines, and electron microscopes. Physics is the basis for all types of analytical and measuring systems.
- 3. Physics classes help polish the skills needed to score well on the SAT.** Physics classes provide practice in both algebra and geometry. These are the types of mathematics most likely to occur on the SAT. However, physics is not just a math class. To work physics problems, students must be able to read and comprehend short paragraphs then develop problem solving strategies from them. Physics helps develop both math and verbal skills.
- 4. College recruiters recognize the value of physics classes.** College recruiters tend to be favorably impressed by transcripts containing challenging classes like physics. They know it is relatively easy to attain a high GPA by taking a light course load. Some technically oriented college programs will deny entrance to students who have not taken high school physics.
- 5. College success for virtually all science, computing, engineering, and premedical majors depends in part on passing physics.** College physics is required or all of these majors. Engineering is largely applied physics. Pre-medicine majors typically must take the same number of physics as biology classes! About 25% of the science knowledge required for the MCAT (Medical College Admission Test) is based on physics. Studies (ref 2,4) indicate that a high quality high school physics course helps significantly reduce the failure rate in college-level physics. Students themselves typically indicate that high school physics is a significant factor in their ability to handle college-level physics material.
- 6. Physics classes hone thinking skills.** Physics is a whole brain subject requiring students to use both right and left brain regions for translating complex verbal information into pictures and finally into mathematical models in order to solve problems. In addition to the subject's content knowledge, physics requires students to develop higher level thinking--a useful skill in any endeavor.
- 7. The job market for people with skills in physics is strong.** Engineers are applied physicists and comprise the second largest profession in America (second only to teaching) with about 1.4 million members. By comparison, there are about 600 thousand medical doctors and only around 100 thousand biologists. However, even medical doctors and most biologists have to take college-level physics courses. Knowledge of physics is a prerequisite for many forms of [employment](#).

- 8. A knowledge of physics is helpful for understanding the arts.** Physics is the science of sound and is needed for understanding how musical instruments work. Physics is also the science of light and is key to understanding visual artwork including paintings, photograph, stage lighting, filmmaking, etc. Even literary works have been influenced by physics. William Faulkner, for example, used the symbolism of time dilation in *The Sound and the Fury*. Many commonly used expressions in everyday language come from physics, including *quantum leap*, *free fall*, *light years*, *black holes*, *resonance*, and *being on the same wave length*.
- 9. To understand physics is to better understand politics, history, and culture.** Due to global warming, the supply and use of energy is a high-profile 21st century issue. However, it's always been a defining issue--even in primitive cultures. The bow and arrow, for example, profoundly altered the effectiveness of hunting and warfare by giving people a device that stored energy then released it suddenly as a deadly projectile . Changes in energy use and supply produced the industrial revolution in the 1800s and ushered in all kinds of inventions from reliable internal combustion engines to practical electrical devices. The most significant historic event of the 20th Century, WWII, began for the United States, with the bombing of Pearl Harbor by the Japanese using battle tactics shaped by an understanding of projectile motion physics and ended with a nuclear bomb blast enabled by physicists.
- 10. Physics offers a deep and unique perspective in itself:** There is quite simply no other area of study quite like it.

Does Art Influence Physicists

Yes! Einstein played the violin. Richard Feynman (winner 1965 Nobel Prize in Physics) played the bongo drums, composed music, and had a one-man art show. Russian physicist Léon Theremin invented one of the first electronic instruments, the Theremin. Inspired by it Dr. Robert Moog (PhD in engineering physics) revolutionized electronic music by inventing the Moog synthesizer. Leonardo da Vinci, developed a wave theory of light based on visual observations as an artist. The physics term *quark and boojum* came from the literary works of James Joyce and Carroll respectively (ref 12).

References: <http://www.intuitior.com/physics/physmain.php>

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<http://www.aps.org/programs/education/highschool/teachers/why-physics.cfm>