

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

The significant advantages of taking high school physics is one of the best kept secrets in American education. For most students physics is challenging. Many lack the confidence to attempt it unless encouraged to do so and all too often that does not happen. Part of the reason is the fact that relatively few high school science teachers, let alone counselors and administrators, have had significant training in physics or are fully aware of its significance to career possibilities. Individuals who are well qualified to teach physics are often attracted away from teaching by the significantly higher paychecks available in industry. Those students fortunate enough to attend a high school with a strong physics program should make every effort to take advantage of it for the following reasons:

1. Most modern technology came from physics. Any technology involving electricity, magnetism, mechanics, heat, light, sound, optics, etc. comes from physics. Even though the basic knowledge required to discover fertilizers, drugs, plastics, and chemicals comes from chemistry and in some cases biology, all of these items have to be manufactured, and manufacturing is dominated by physics-based technology.

2. Most branches of sciences contain principles obtained from physics. Like technology, it is hard to find a branch of science which does not contain some physics-related aspect such as electricity, magnetism, mechanics, heat, light, sound, optics, etc. Chemistry in particular becomes indistinguishable from physics when delving into the atomic model. Physics has been called the most basic science and in many cases it is required in order to understand concepts in other sciences.

3. Physics classes can 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 which are most likely to occur on the SAT. However, physics is not a math class. To understand the concepts of physics students have to use analogies. To work physics problems, students must be able to read and comprehend short paragraphs packed with information. Physics develops 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. Success in high school physics is considered a sign of academic maturity and ability. Some technically oriented college programs will deny entrance to students who have not taken high school physics.

5. College success for virtually all science, computer, engineering, and premedical majors depends on passing physics. College level physics is a required course for all of these majors. Engineering is almost entirely applied physics. Pre-medicine majors are typically required to take the same number of physics as biology classes! Also, about 25% of the science knowledge required for the MCAT (Medical College Admission Test) is based on physics. College physics courses for freshman often have 200 or more students in them and can be impersonal. They move at a fast pace and have a high failure rate. Some colleges will not allow a student to take college level physics unless they have had high school physics. Studies (ref 2, 4) indicate that a high quality high school physics course helps significantly reduce the failure rate in college-level physics. These studies suggest that students with a high school physics course score on average about one letter grade higher in college physics than students with no high school

physics background. 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 about the only high school-level class which requires both mathematical and verbal skills. All problems in physics are word problems which require students to think logically, use analogies, and deal with subtle shades of meaning. Passing scores in AP (Advanced Placement) calculus correlate with high PSAT math scores. Passing scores in AP literature courses correlate with high PSAT verbal scores. AP physics is the only AP course where passing scores correlate with both high verbal and high math PSAT scores. Physics courses teach students to think and this is a valuable skill apart from the knowledge content of physics. For instance the law school entrance exam [LSAT](#) requires no particular content knowledge; however, about 67% of an applicant's score depends on answering logical reasoning and logic game questions.

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 500 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 needed to understand music, art, and literature. Physics is the science which deals with sound. It is impossible to understand how instruments work or to build a theory of music without resorting to physics. Einstein, for instance, was an accomplished violinist. Physics is also the science

of light. What could be more basic to an understanding of art? Leonardo da Vinci was not only a great artist but also an outstanding physicist. He was one of the first physicists to develop a wave theory of light. Clearly physicists have been influenced by literary figures. The physics term quark was taken from James Joyce and the term boojums from Lewis Carroll (ref 12). By the same token, many commonly used expressions in our everyday language come from physics. These include quantum leap, free fall, light years, black holes, resonance, and being on the same wave length. Many authors have used allusions to physics in their literary works. William Faulkner, for instance, used the symbolism of time dilation in *The Sound and the Fury*. John Updike and a host of other poets have used physics metaphors in their work. The arts and humanities cannot be fully understood without some background in physics.