



Lakewood High School

AP Physics



Course Overview:

AP Physics 1 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of Physics through inquiry-based investigations as they explore topics such as Newtonian mechanics (including rotational motion); work, energy, and power; mechanical waves and sound; and introductory, simple circuits.

Prerequisites:

Students should have completed previous math and science classes with a B or better. Students should have completed or be concurrently taking Algebra 2.

Laboratory Requirements:

This course requires that 25 percent of the instructional time will be spent in hands-on laboratory work, with an emphasis on inquiry based investigations that provide students with opportunities to apply the science practices.

MAJOR THEMES IN THE COURSE:

Students explore principles of Newtonian mechanics (including rotational motion); work, energy, and power; mechanical waves and sound; and introductory, simple circuits. The course is based on six Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about the physical world.

The following are Big Ideas:

- *Objects and systems have properties such as mass and charge. Systems may have internal structure.*
- *Fields existing in space can be used to explain interactions.*
- *The interactions of an object with other objects can be described by forces.*
- *Interactions between systems can result in changes in those systems.*
- *Changes that occur as a result of interactions are constrained by conservation laws.*
- *Waves can transfer energy and momentum from one location to another without the permanent transfer of mass and serve as a mathematical model for the description of other phenomena*

Science Practices:

Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices enables teachers to use the principles of scientific inquiry to promote a more engaging and rigorous experience for AP Physics students. Such practices require that students: • Use representations and models to communicate scientific phenomena and solve scientific problems; • Use mathematics appropriately; • Engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course; • Plan and implement data collection strategies in relation to a particular scientific question; • Perform data analysis and evaluation of evidence; • Work with scientific explanations and theories; and • Connect and relate knowledge across various scales, concepts, and representations in and across domains.

Inquiry-Based Investigations:

Twenty-five percent of instructional time is devoted to hands-on laboratory work with an emphasis on inquiry-based investigations. Investigations will require students to ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress.