

Physics

Course Syllabus

Teacher _____

Physics is a first-year, inquiry-based introductory course dealing with a broad range of topics. The focus of the course is the concepts behind physical phenomena. In addition, a strong algebra and geometry background is necessary to express these concepts using mathematical equations.

On-Level and Honors Physics cover the same topics. Honors Physics does extend a few topics and solves problems with more mathematical sophistication. The courses have different minimum math prerequisites. On-Level Physics requires successful completion of Algebra I and Geometry; Honors Physics requires successful completion of Algebra I, Geometry and concurrent enrollment in Algebra II.

Course Objectives

- Physics seeks to explain the universe through models.
- The universe behaves in a predictable manner determined by a small set of rules.

Megaspores/Units	Sub Units of Study
Motion - All motion can be described using the terms position, displacement, velocity, and acceleration.	<ul style="list-style-type: none"> • Constant Motion - The movement of an object at a constant rate. • Changing Motion - The movement of an object at a changing rate.
Force - A net force is required to change an object's velocity; no force is required to explain constant velocity	<ul style="list-style-type: none"> • Newton's Laws of Motion - Three laws of motion that govern the study of Mechanics. • 2 Dimensional Motion - Application of Constant Motion, Changing Motion, and Newton's First and Second Laws to Projectiles • Uniform Circular Motion and Gravity - Application of Newton's Second and Third Laws to Circular Motion and Gravitational Force
Interactions - Momentum and energy are conserved when objects interact.	<ul style="list-style-type: none"> • Work and Energy - Application of Newton's Third Law, Equal and opposite forces acting through the same displacement. • Impulse and Momentum - Application of Newton's Third Law. Equal and opposite forces acting over the same time interval.
Electromagnetism - All electric and magnetic phenomena are due to the motion of charged particles.	<ul style="list-style-type: none"> • Electrostatics - The interactions of charged particles with electric fields. • Circuits - The movement of charged particles in an electric circuit. • Magnetism - The interactions of charged particles with magnetic fields.
Waves - Waves interact with their environment, exhibiting a variety of wave phenomena.	<ul style="list-style-type: none"> • Mechanical Waves - A disturbance that moves through a medium. • Electromagnetic Waves - A periodic disturbance of electric and magnetic fields.
Modern - Modern physics studies the smallest particles in nature in order to develop a deeper understanding of fundamental processes.	<ul style="list-style-type: none"> • Modern Physics - The interaction of photons and electrons

Textbook - Physics by Zitzewitz
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What's Next?: Upon successful completion of first-year physics, students may take either AP Physics 1-2 or AP Physics C. The courses have different minimum math prerequisites. AP Physics 1-2 requires concurrent enrollment in Precalculus; AP Physics C requires concurrent enrollment in AP Calculus.

If students are not interested in a second year of physics, they may choose from: AP Biology, AP Chemistry, AP Environmental Science, Anatomy and Physiology, Environmental Systems or Earth and Space Science.

