

AP Physics I

Course Description:

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 these topics: kinematics, dynamics, circular motion and gravitation, energy, momentum, simple harmonic motion, torque and rotational motion, electric charge and electric force, DC circuits, and mechanical waves and sound.

The main goal of this course is to help students develop a deep understanding of the foundational principles that shape classical mechanics. By confronting complex physical situations or scenarios, the course is designed to enable students to develop the ability to reason about physical phenomena using important science practices, such as explaining relationships, applying and justifying the use of mathematical routines, designing experiments, analyzing data, and making connections across multiple topics within the course.

Scope and Sequence

Unit 1: Kinematics

Unit 2: Dynamics

Unit 3: Circular Motion and Gravitation

Unit 4: Energy

Unit 5: Momentum

Unit 6: Simple Harmonic Motion

Unit 7: Torque and Rotational Motion

Course Enduring Understandings:

- Modeling: Use representations and models to communicate scientific phenomena and solve scientific problems.
- Mathematical Routines: Use mathematics appropriately.
- Scientific Questioning: Engage in scientific questioning to extend thinking or guide investigations.
- Experimental Methods: Plan and implement data collection strategies in relation to a particular scientific question.
- Data Analysis: Perform data analysis and evaluation of evidence.
- Argumentation: Work with scientific explanations and theories.
- Making Connections: Connect and relate knowledge across various scales, concepts, and representations in and across domains.

Course Essential Questions:

- What factors affect force?
- What factors affect inertia?
- What is the relationship between an object's position and change in time?
- What does the slope of a position-time graph represent?
- What is the relationship between the net force and acceleration on an object?
- What is the effect on an object's motion when forces are not balanced?
- How are work and energy related?
- How are series and parallel circuits similar and different?
- How are waves related to energy?

Student Learning Overview:

- Inquiry-based laboratory experiences support the AP Physics 1 course and AP Course Audit curricular requirements by providing opportunities for students to engage in the seven science practices as they design plans for experiments, make predictions, collect and analyze data, apply mathematical routines, develop explanations, and communicate about their work.