

Reading Public Schools

Instilling a joy of learning and inspiring the innovative leaders of tomorrow



Curriculum Guide

AP PHYSICS 1

Course Description

AP Physics 1 is an algebra-based physics course recommended for highly motivated students, with an aptitude for the sciences and developed math skills. 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 with an overall emphasis on real-life problem solving. Students will keep a laboratory notebook detailing each experiment that they design and implement and will be expected to delve deeply into problem-solving. Students who have taken Physics may take AP Physics 1 as a second-year physics option.

Content Standards

Content Standards are presented as “Big Ideas” in AP Physics 1. These “Big Ideas” spiral across topics and units and include:

Big Idea 1– Systems

Objects and systems have properties such as mass and charge. Systems may have internal structure.

Big Idea 2– Fields

Fields existing in space can be used to explain interactions.

Big Idea 3– Force Interactions

The interactions of an object with other objects can be described by forces.

Big Idea 4- Change

Interactions between systems can result in changes in those systems.

Big Idea 5– Conservation

Changes that occur as a result of interactions are constrained by conservation laws.

Big Idea 6- Waves

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.

Skills Practices/Skills

Science practices spiral throughout the course.

Science Practice 1— Modeling The student can use representations and models to communicate scientific phenomena and solve scientific problems.

Science Practice 2— Mathematical Routines The student can use mathematics appropriately

Science Practice 3— Scientific Questioning The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.

Scientific Practice 4— Experimental Methods The student can plan and implement data collection strategies appropriate for a particular scientific question.

Scientific Practice 5 — Data Analysis The student can perform data analysis and evaluation of evidence.

Scientific Practice 6 — Argumentation The student can work with scientific explanations and theories.

Scientific Practice 7 — Making Connections The student is able to connect and relate knowledge across

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Curriculum Guide Overview

Curriculum Guide

Curriculum guides are public documents aligned with the Massachusetts Department of Education Curriculum Frameworks. They focus on the set of standards that students will learn within certain disciplines at appropriate grade levels. Each area of the curriculum is divided into general strands (broad categories) under which the standards fall. When we discuss “standards-based education” we mean that students are measured against their proficiency and growth towards meeting these standards. Curriculum Guides are intended for teachers, parents, and the wider school community as an overview document of the course of study for the year.

Content Standards

The content standards for Advanced Placement classes at Reading Memorial High School are set by the College Board. For more information please refer to: <https://apstudents.collegeboard.org/courses/ap-physics-1-algebra-based>

Science and Engineering Practices

The integration of science and engineering practices in high school science courses gives students dynamic and relevant opportunities to refine and communicate science understandings to be well prepared for civic life, postsecondary education, and career success.

Essential Questions

Essential questions are questions that are not answerable with an easy answer or a simple instruction. The purpose of essential questions is to provide opportunities

Key Activities

Key Activities identified in Curriculum Guides are not intended to be exhaustive, nor are they intended to be prescriptive. The activities identified may function as a menu of curriculum resources from which educators identify the most appropriate tools to utilize in their classrooms.