

Physics 1 Course Syllabus

Course Name: Physics 1

Description: In each module of Physics 1, students discover the contributions of scientific geniuses like Galileo, Newton, and Einstein. Through their work, students learn the concepts, theories, and laws that govern the interaction of matter, energy, and forces. From tiny atoms to galaxies with millions of stars, the universal laws of physics are explained through real-world examples. Using laboratory activities, simulations, images, and interactive elements, students follow in the footsteps of some of the world's greatest thinkers.

Prerequisites: Algebra I; Algebra II recommended.

Estimated Completion Time: 2 segments / 32-36 weeks.

Major Topics and Concepts:

Segment I:

- Plagiarism, Writing, Validating Resources
- Measurement Techniques
- Graphical Analysis
- Experimental Techniques
- Lab Design
- Speed, Velocity, Acceleration
- Problem-Solving Methods
- Vector and Scalar Quantities
- Equation Manipulation
- Freefall and Gravity
- Newton's Laws of Motion
- The Fundamental Forces
- Newton's Law of Universal Gravitation
- Coulomb's Law
- Mass and Weight
- Free-body Diagrams
- Uniform Circular Motion
- Momentum and Angular Momentum

Segment II:

- Engineering Design
- Temperature and Heat
- Conservation of Thermal Energy
- Kinetic and Potential Energy
- Work and Power
- Energy Models and Devices
- Conductors and Insulators

- Electrical Fields and Forces
- Simple, Series, and Parallel Circuits
- Schematic Diagrams
- Simple Harmonic Motion
- Wave Behavior and Equation
- Ray Diagrams
- Lenses and Mirrors
- Snell's Law
- Telecommunications and Digital Information
- Atomic Theory
- Atoms and Molecules
- Fundamental Particles
- Duality of Light
- Radioactivity
- Nuclear Fission and Nuclear Fusion
- Special Relativity and Cosmology

Course Assessment and Participation Requirements:

To achieve success, students are expected to submit work in each course weekly. Students can learn at their own pace; however, “any pace” still means that students must make progress in the course every week. To measure learning, students complete self-checks, practice lessons, multiple choice questions, projects, discussion-based assessments, and discussions. Students are expected to maintain regular contact with teachers; the minimum requirement is monthly. When teachers, students, and parents work together, students are successful.
