



G-E-T High School Curriculum

Align, Explore, Empower

Scope and Sequence

Physical Science

Unit 1 - Energy and Motion

(9 weeks Block/18 weeks Period)

- The study of forces relates motion of objects to the forces applied to those objects and calculates work, power, or efficiency of machines affecting those objects.

In this unit, students will ...

- Identify steps scientists use to solve problems
- Compare and contrast science and technology
- Describe Newton's Laws of Motion
- Relate how force affects motion
- Calculate velocity, acceleration, momentum, and force.
- Explain the law of gravity
- Describe the difference between mass and weight
- Demonstrate the Law of Conservation of Mass and Energy
- Distinguish between Kinetic and Potential Energy
- Relate energy and work
- Perform calculations for work, energy, and efficiency
- Explain how the different machines make doing work easier
- Calculate the mechanical advantage and efficiency of a machine

Resource(s): Ch. 1-5 Glencoe Physical Science 2005; Explore Learning (<https://gizmos.explorellearning.com>)

Standards for Physical Science: Unit 1

HS-PS-1: Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.

HS-PS-2: Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.

HS-PS2-3: Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.

HS-PS2-4: Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.

HS-PS3-1: Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.

HS-PS3-2 Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motion of particles (objects) and energy associated with the relative positions of particles (objects).

Unit 2 - **The Nature of Matter**

(2 weeks Block/4 weeks Period)

- The study of the nature of matter relates the physical and chemical properties to the different states of matter.

In this unit, students will ...

- Define substances and mixtures
- Identify elements and compounds
- Compare and contrast solutions, colloids, and suspensions
- Compare and contrast physical and chemical properties and changes
- Determine how the law of conservation of mass applies to chemical changes

Resource: Ch. 15 and 16, Glencoe Physical Science 2005

Standards for Physical Science: Unit 2

HS-PS1-1: Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

HS-PS1-7: Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

Unit 3 - The Diversity of Matter

(7 weeks Block/14 weeks Period)

- The study of atoms combines the study of individual atoms and reasoning for elements organization (periodic law) in the periodic table.

In this unit, students will ...

- Describe how atoms are made of subatomic particles
- Explain the differences between Bohr Models and the Electron Cloud Model
- Compute the atomic mass and mass number of an atom
- Identify isotopes of common elements
- Explain the composition of the periodic table
- Differentiate between ionic and covalent bonds
- Explain how to determine oxidation numbers
- Write formulas and name ionic and covalent compounds and molecules
- Identify reactants in a chemical reaction
- Balance chemical equations
- Compare exothermic and endothermic reactions
- Examine the effects of catalysts and inhibitors on a chemical reaction
- Understand how a chemical reaction satisfies the law of conservation of mass

Resource: Ch. 16, 17, 20 and 21, Glencoe Physical Science 2005

Standards for Physical Science: Unit 3

HS-PS-1: Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

HS-PS-3: Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.

H-PS1-7: Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

HS-PS1-8: Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.