



Physical Science

The following learning targets represent the major concepts studied and assessed in this course.

Semester 1:

Unit 1: Structure and Properties of Matter

- Calculate the densities of regular and irregular objects.
- Identify substances by their physical and chemical properties.
- Distinguish between physical and chemical changes.
- Explain the changes that occur when objects are heated or cooled.
- Compare and contrast the properties of acidic, basic, and neutral solutions.
- Describe the structure of an atom.
- Calculate the number of protons, neutrons and electrons within an atom based on the atomic number and mass.
- Determine the electrical charge and chemical stability based on the atomic number and mass.
- Explain the structure of the periodic table.
- Classify elements as metals, nonmetals, metalloids, and noble gases based on their location in the periodic table.
- Predict the reactivity of an element based on its position in the periodic table.
- Describe what happens to the nucleus of during a nuclear reaction.

Unit 2: Chemical Reactions

- Explain how valence electron configurations determine how atoms interact and bond.
- Determine if a reaction is endothermic or exothermic.
- Predict the reaction rates of substances based on their properties.
- Predict the products of acid-base, oxidation, and combustion reactions.
- Compare the masses of reactants and products to support the conservation of mass.
- Explain why the number of atoms in the reactants and products must be equally balanced.

Semester 2:

Unit 3: Forces and Interactions

- Explain the relationship between an object's kinetic energy and its mass and velocity.
- Relate an object's potential energy to its weight and height.
- Identify examples of kinetic and potential energy within a system.
- Represent objects motion graphically.
- Calculate an object's total force.
- Calculate an object's acceleration using its net force and mass.
- Describe energy transfers within a system.
- Compare the momentums of two objects in relation to mass and velocity.
- Explain how momentum remains constant within a system.
- Create force diagrams.
- Compare gravitational forces between objects.

Unit 4: Energy

- Calculate changes in energy within a system.
- Describe how energy can be stored within a system.
- Compare and contrast various forms of energy used for human activity.
- Describe how energy is transferred within exothermic and endothermic reactions.

Unit 5: Waves and Electromagnetic Radiation

- Explain how frequency and wavelength are related.
- Calculate wavelength and frequency.
- Explain how the media a wave travels through can alter its wavelength and frequency.
- Describe the different models to describe electromagnetic radiation.
- Compare and contrast the wave model and the particle models
- Describe how electromagnetic radiation interacts with matter.
- Describe how electromagnetic radiation effects humans' lives.