

PHYSICAL SCIENCE: ACADEMIC STANDARDS

PSCI.PS1: Matter and Its Interactions

- 1) Use a model to explain the changes of state for solids, liquids, gases, and plasma using the kinetic molecular theory and heat flow considerations.
- 2) Carry out an investigation to graphically represent the relationship(s) among pressure, volume, and temperature of a gas.
- 3) Engage in an argument from evidence to explain physical and chemical changes.
- 4) Use a model to predict the relative properties of elements on the periodic table.
- 5) Predict how elements may combine using the patterns of electrons in the outermost energy level.
- 6) Predict the formulas of binary ionic compounds using the periodic table.
- 7) Develop, or use, a model to illustrate the claim that atoms and mass are conserved during a chemical reaction (i.e., balancing chemical equations).
- 8) Develop, or use, a model to classify a substance as acidic, basic, or neutral by using pH tools and appropriate indicators.

PSCI.PS2: Motion and Stability: Forces and Interactions

- 1) Use mathematics and computational thinking to graphically represent how various factors (e.g., position, time, direction of force) affect one-dimensional kinematics parameters (e.g., distance, displacement, speed, velocity, acceleration).
- 2) Use mathematics and computational thinking to solve problems involving constant velocity and constant acceleration in one-dimension.
- 3) Plan and carry out an investigation to gather evidence, and provide a mathematical explanation, about the relationship among force, mass, and acceleration using $F=ma$.
- 4) Use mathematical reasoning and computational thinking to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.
- 5) Design, evaluate, and refine a device that minimizes the force on an object during a collision.
- 6) Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field.

PSCI.PS3: Energy

- 1) Use mathematical and computational thinking to solve problems regarding the work-energy theorem and power using various forms of energy (e.g., kinetic, gravitational potential, elastic potential).
- 2) Plan and conduct an investigation to provide evidence that thermal energy will move as heat between objects of two different temperatures, resulting in a more uniform energy distribution among objects.
- 3) Design, build, and refine a device within design constraints that has a series of simple machines to transfer energy and/or do mechanical work.
- 4) Plan and carry out an investigation to examine the relationships among kinetic, potential, and total energy within a closed system (i.e., the Law of Conservation of Energy).

5) Design, build, and construct simple series circuits and simple parallel circuits using Ohm's Law.

PSCI.PS4: Waves and Their Applications in Technologies for Information Transfer

- 1) Construct an explanation to compare and contrast the properties of transverse and longitudinal waves, including examples of each.
- 2) Obtain, evaluate, and communicate information to describe the similarities and differences across the electromagnetic spectrum, including devices used to measure the characteristics of the electromagnetic spectrum.