

**Disciplinary Core Ideas**

***Physical Sciences***

**PS1—MATTER AND ITS INTERACTIONS**

*How can one explain the structure, properties, and interactions of matter?*

**PS1.A: Structures and Properties of Matter:** *How do particles combine to form the variety of matter one observes?*

**PS1.B: CHEMICAL REACTIONS:** *How do substances combine or change (react) to make new substances? How does one characterize and explain these reactions and make predictions about them?*

**PS1.C: NUCLEAR PROCESSES:** *What forces hold nuclei together and mediate nuclear processes?*

**PS2—Motion and Stability: Forces and Interactions**

*How can one explain and predict interactions between objects and within systems**of objects?*

**PS2.A: Forces and Motion** *How can one predict an object’s continued motion, changes in motion, or stability?*

**PS2.B: TYPES OF INTERACTIONS:** *What underlying forces explain the variety of interactions observed?*

**PS2.C: STABILITY AND INSTABILITY IN PHYSICAL SYSTEMS:** *Why are some physical systems more stable than others?*

**PS3—Energy**

*How is energy transferred and conserved?*

**PS3.A: DEFINITIONS OF ENERGY:** *What is energy?*

**PS3.B: CONSERVATION OF ENERGY AND ENERGY TRANSFER:** *What is meant by conservation of energy? How is energy transferred between objects or systems?*

**PS3.C: RELATIONSHIP BETWEEN ENERGY AND FORCES:** *How are forces related to energy?*

**PS3.D: ENERGY IN CHEMICAL PROCESSES AND EVERYDAY LIFE:** *How do food and fuel provide energy? If energy is conserved, why do people say it is produced or used?*

**PS4—Waves and Their Applications in Technologies for Information Transfer**

*How are waves used to transfer energy and information?*

**PS4.A: WAVE PROPERTIES:** *What are the characteristic properties and behaviors of waves?*

**PS4.B: ELECTROMAGNETIC RADIATION:** *What is light? How can one explain the varied effects that involve light? What other forms of electromagnetic radiation are there?*

**PS4.C: INFORMATION TECHNOLOGIES AND INSTRUMENTATION:** *How are instruments that transmit and detect waves used to extend human senses?*