Disciplinary Core Ideas in the Physical Sciences

Core Idea PS1: Matter and Its Interactions

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

PS1.A Structure 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?

Core Idea PS2: Motion and Stability: Forces and Interactions

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

FS2.A Forces and Motion

How can one predict an object's continued motion, changes in motion, or stability?

FS2.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?

Core Idea 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?

Core Idea 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?