

8th Physical Science Pacing Guide

Cross-cutting Concepts: Energy and Matter; Cause and Effect; Systems and System Models, Patterns

Interactions of Energy and Matter

7-week Instructional Segment

Anchoring Phenomenon	Standard	Sample Lessons	Disciplinary Core Ideas	Science and Engineering Practices	Notes
<p>The investigation of the electromagnet and fields of force will be central to understanding simple motors and generators as well as other applications, including the MagLev train.</p>	<p>S8P2. c, d S8P5. a, b, c</p>	<p>Interactions of Energy and Matter</p>	<p>From A Framework for K-12 Science Education:</p> <p>By the end of grade 8: PS2.B: TYPES OF INTERACTIONS</p> <ul style="list-style-type: none"> ● Electric and magnetic (electromagnetic) forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or magnetic strengths involved and on the distances between the interacting objects. ● Forces that act at a distance (gravitational, electric, and magnetic) can be explained by force fields that extend through space and can be mapped by their effect on a test objects (a ball, a charged object, or a magnet, respectively). ● Two magnetic and electrically charged objects interacting at a distance exert forces on each other that can transfer energy between the interacting objects. <p>PS3.A: DEFINITIONS OF ENERGY</p> <ul style="list-style-type: none"> ● The term “heat” as used in everyday 	<ul style="list-style-type: none"> ● Develop and use models ● Plan and carry out investigations transformations ● Analyze and interpret data ● Use mathematical and computational thinking ● Construct explanations and design solutions ● Engage in argument from evidence 	<p>Background <i>Teacher Hint: Use images from and/or field trips of power plants that serve local community.</i></p> <p>By the end of this unit, students are using the following language in their speaking and writing during EXPLAIN or ELABORATE.</p> <ul style="list-style-type: none"> ● Energy transformation ● Thermal energy- radiation, conduction, convection ● Electrical and magnetic force ● Complete, series and parallel circuits ● Electromagnet ● Generator

			<p>language refers to both thermal energy (the motion of atoms or molecules within a substance) and energy transfers by convection, conduction, and radiation (particularly infrared and light).</p> <p>PS4.C: INFORMATION, TECHNOLOGIES, AND INSTRUMENTATION</p> <ul style="list-style-type: none"> ● Appropriately designed technologies (e.g., radio, television, cell phones, wired and wireless computer networks) make it possible to detect and interpret many types of signals that cannot be sensed directly. ● Many modern communication devices use digitized signals (sent as wave pulses) as a more reliable way to encode and transmit information. ● Energy is stored in the electric fields between charged particles and magnetic fields between magnets. 		<ul style="list-style-type: none"> ● Static electricity ● Electrons ● Conductors ● Insulators ● Conduction ● Induction ● Friction
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This instructional segment will connect to: Structure and Properties of Matter.