



Grades 6–8

3.2.6-8.P Physical Science: Energy

Students who demonstrate understanding can *develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.*

Clarifying Statement: Emphasis is on relative amounts of potential energy, not on calculations of potential energy. Examples of objects within systems interacting at varying distances could include: the Earth and either a roller coaster cart at varying positions on a hill or objects at varying heights on shelves, changing the direction/orientation of a magnet, and a balloon with static electrical charge being brought closer to a classmate’s hair. Examples of models could include representations, diagrams, pictures, and written descriptions of systems.

Assessment Boundary: Assessment is limited to two objects and electric, magnetic, and gravitational interactions.

Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Crosscutting Concepts (CCC)
<p>Developing and Using Models</p> <p>Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.</p> <ul style="list-style-type: none"> Develop a model to describe unobservable mechanisms. 	<p>PS3.A: Definitions of Energy</p> <ul style="list-style-type: none"> A system of objects may also contain stored (potential) energy, depending on their relative positions. <p>PS3.C: Relationship Between Energy and Forces</p> <ul style="list-style-type: none"> When two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object. 	<p>Systems and System Models</p> <ul style="list-style-type: none"> Models can be used to represent systems and their interactions – such as inputs, processes, and outputs – and energy and matter flows within systems.

Pennsylvania Context: Examples of Pennsylvania context include but are not limited to Pennsylvania’s amusement or theme parks.

PA Career Ready Skills: Make a decision based upon anticipated consequences.

Connections to Other Standards Content and Practices

Standard Source	Possible Connections to Other Standard(s) or Practice(s)
Agriculture (AFNR)	CS.01.02.02.b: Analyze how technology is used in AFNR systems to maximize productivity.
Science, Environmental Literacy and Sustainability (NAEE)	5-8 Strand 2.1.A. Earth’s physical systems: Learners describe the physical processes that shape Earth, including weather, climate, plate tectonics, and the hydrologic cycle. They explain how matter cycles and energy flows among the abiotic and biotic components of the environment. They describe how humans affect and are affected by Earth’s physical systems.
PA Core Standards: ELA	CC.3.5.6-8.G: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).



Standard Source	Possible Connections to Other Standard(s) or Practice(s)
PA Core Standards and Practices: Math	N/A
PA Standards: Social Studies	N/A
Educational Technology (ISTE)	1.6. Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
Technology and Engineering (ITEEA)	STEL-2N: Illustrate how systems thinking involves considering relationships between every part, as well as how the system interacts with the environment in which it is used.