



**Grades 6–8**

**3.2.6-8.I Physical Science: Forces and Interactions**

**Students who demonstrate understanding can ask questions about data to determine the factors that affect the strength of electric and magnetic forces.**

**Clarifying Statement:** Examples of devices that use electric and magnetic forces could include electromagnets, electric motors, or generators. Examples of data could include the effect of the number of turns of wire on the strength of an electromagnet, or the effect of increasing the number or strength of magnets on the speed of an electric motor.

**Assessment Boundary:** Assessment about questions that require quantitative answers is limited to proportional reasoning and algebraic thinking.

Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Crosscutting Concepts (CCC)
<p><b>Asking Questions and Defining Problems</b></p> <p>Asking questions and defining problems in 6–8 builds from K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models.</p> <ul style="list-style-type: none"> <li>Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles.</li> </ul>	<p><b>PS2.B: Types of Interactions</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>Cause and effect relationships may be used to predict phenomena in natural or designed systems.</li> </ul>

**Pennsylvania Context:** N/A

**PA Career Ready Skills:** Analyze various perspectives on a situation.

**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.A: Cite specific textual evidence to support analysis of science and technical texts.
PA Core Standards and Practices: Math	MP.2: Reason abstractly and quantitatively.



Standard Source	Possible Connections to Other Standard(s) or Practice(s)
PA Standards: Social Studies	N/A
Educational Technology (ISTE)	1.3. Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
Technology and Engineering (ITEEA)	STEL-8M: Use instruments to gather data on the performance of everyday products.