

8.3 Forces at a Distance

Content Area: **Science**
Course(s): **Science 8**
Time Period: **Marking Period 2**
Length: **30 days**
Status: **Published**

Established Goals/Standards

SCI.MS-PS2	Motion and Stability: Forces and Interactions
SCI.MS-PS2-3	Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
SCI.MS-PS2-5	Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

Technology Standards

TECH.8.1.8.A.3	Use and/or develop a simulation that provides an environment to solve a real world problem or theory.
TECH.8.1.8.B.1	Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web).
TECH.8.1.8.B.CS2	Create original works as a means of personal or group expression.

NJ 21st Century Life and Careers/NJ Career Ready Practices

CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.
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Interdisciplinary Connections

ELA/Literacy - [SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. \(MS-PS3-2\)](#)

ELA/Literacy -

[RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. \(MS-PS4-3\)](#)

[RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. \(MS-PS4-3\)](#)

[RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. \(MS-PS4-3\)](#)

[WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research. \(MS-PS4-3\)](#)

Essential Questions

- How can a magnet move another object without touching it?

Enduring Understanding

- Electricity can be generated by passing a magnet next to a wire.
- Electricity is the motion of electrons that are not attached to a specific atom.
- How speakers use magnetism to create sound.
- Objects can be made magnetic by aligning their atoms in the same direction.

Content

- Definition of electricity.
- Definition of magnetism.
- Designing electrical circuits from schematics.
- Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information than are analog signals.
- Electrical current and its relationship to voltage and resistance.
- Electrical schematics: how engineers draw electrical circuits so others will understand the components.
- Explore how electricity is generated.
- How speakers work.
- Magnetic properties and how to obtain them.
- Wave-related technologies extend the measurement, exploration, modeling, and computational capacity of scientific investigations.

Assessment

Summative assessment: students who understand the concepts are able to:

- Students will conduct an investigation and evaluate an experimental design to produce data that can serve as the basis for evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.
- Students will identify the cause-and-effect relationships between fields that exist between objects and the behavior of the objects.
- Students will ask questions about data to determine the effect of the strength of electric and magnetic forces 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.
- Students will perform investigations using devices that use electromagnetic forces.

- Students will collect and analyze data that 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.

Formative Assessments

- Participation/Observations
- Questioning
- Discussion Circles
- Science Notebook
- Exit Slips
- Peer/Self Assessment
- Rubrics
- Teacher-created project-based assessment
- Turn & Talk

Alternate Assessments

- Teacher-created project-based assessment
- Alternate running records
- Discussion Circles
- Turn and Talks

Benchmark Assessments

- Teacher-created assessment

Accommodations and Modifications

Accommodations and Modifications according to student IEP, 504, I&RS goals, and/or gifted status.

Resources

- Amplify
- BrainPOP
- OpenSciEd