

Gr. 6 - Understanding Matter & Energy

Electricity and Electrical Devices

Easy Electromagnet

Specific Expectations:

2.1 Follow established safety procedures for working with electricity.

2.5 Use technological problem-solving skills to design, build, and test a device that transforms electrical energy into another form of energy to perform a function.

2.6 Use appropriate science and technology vocabulary, including *current, battery, circuit, transform, static, electrostatic, and energy*, in oral and written communication.

3.5 Identify ways in which electrical energy is transformed into other forms of energy.

3.6 Explain the functions of the components of a simple electrical circuit.

Big Idea (for lesson):

Students investigate the electromagnetic force by building an electric circuit and experimenting with different materials.

Accommodations:

- Increase time
- Visual Aids
- Manipulatives
- Chunking
- Step-by-Step
- Scaffolding
- Copy of Notes
- Student Grouping

Differentiated Instruction:

- Content: Use demo to show the content as you offer verbal descriptions.
- Process: Have students work in pairs and support each other if physical impediments exist.
- Product: Students may show their final product in pairs, and communicate their findings either verbally, visually, or through written means.
- Other: _____

Bloom's Taxonomy:

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

Multiple Intelligence:

- Verbal/Linguistic
- Logical/Mathematical
- Visual/Spatial
- Bodily/Kinesthetic
- Naturalist
- Musical/Rhythmic
- Interpersonal
- Intrapersonal

Delivering The Lesson:

Portion & Timing	Grouping:	Introduction:	Materials
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<p>Minds On: 15 mins</p>	<p>W <input checked="" type="checkbox"/></p>	<p>S <input type="checkbox"/></p>	<p>I <input type="checkbox"/></p>	<p>Teacher can do a different demonstration for static and current electricity to introduce the lesson:</p> <p>-Static: show the video, or do the demo as it instructs. Ask the students why the balloon is able to levitate (<i>Answer: a build-up of static charge on both the bag and balloon repel each other enough to overcome the force of gravity</i>).</p> <p>-Current: show the students an Energy Stick, first with just you holding it in both hands, then with a pair of students, then with the whole class holding hands to complete the circuit. Ask students why the stick doesn't light up when someone lets go (<i>Answer: there is no longer a path for the electrons to follow, just like if a switch is turned off.</i>)</p>	<p>Easy Electromagnet – Static Flyer – Sick Science! #132 (Towel, bag, balloon) Energy Stick</p>
<p>Action: 15 mins</p>	<p>W <input checked="" type="checkbox"/></p>	<p>S <input checked="" type="checkbox"/></p>	<p>I <input checked="" type="checkbox"/></p>	<p>Have students build their own easy electromagnets according to the instructions on the handout. Teacher can circulate and ask questions of the different groups:</p> <p>-What do you predict will happen when the wire is connected to one end of the battery? (<i>Answer: the circuit is open, so there is no closed path for electrons to follow and nothing will happen</i>)</p> <p>-What will happen when the wire is connected to both ends of the battery? (<i>Answer: the circuit is closed, so the electromagnet should work</i>).</p> <p>-Does it matter which end of the battery you connect to the different wires? (<i>Answer: not in this case, but some light bulbs for example have to be connected a certain way.</i>)</p> <p>-Do you think it makes sense that electricity and magnetism are related? (<i>Answer: it may be weird for some, but both fields come down to charges and forces.</i>)</p>	<p>Easy Electromagnet Handout (Materials listed)</p>

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Consolidate: 10 mins	W <input checked="" type="checkbox"/>	S <input checked="" type="checkbox"/>	I <input type="checkbox"/>	Show the World's Simplest Motor video (or do the demo if you have the materials). You can then ask the class why the bottom of the motor spins, and have them try to draw a circuit diagram of the motor shown.	Easy Electromagnet – World's Simplest Motor Version 02 – Sick Science
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