

Storyline

<p>Investigation 1</p> <p>The Force <u>Key Concept:</u> Magnets have the force of attraction and repulsion.</p>	<p>Part 1 Focus Questions What kind of materials do magnets stick to? What happens when you bring two or more magnets together?</p> <p>Investigating Magnets and Materials</p> <ul style="list-style-type: none"> • Students find that objects that contain iron stick to permanent magnets. • Students find that magnets will either attract or repel other magnets. 	<p>Part 2 Focus Questions What affect do permanent magnets have on other objects? Does magnetic force go through all materials?</p> <p>Investigating More Magnetic Properties</p> <ul style="list-style-type: none"> • Students make temporary magnets using steel objects. • Students identify materials that the magnetic force passes through. 	<p>Part 3 Focus Question How do we measure the force of attraction between two magnets?</p> <p>Breaking the Force Using a balance and large washers, students investigate what happens to the force of attraction as the distance between two magnets increases.</p>	<p>Part 4 Focus Question Can you figure out where two magnets are taped in a box without looking?</p> <p>Detecting the Force of Magnetism Students use compasses and iron filings to detect magnetic force.</p>
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<p>Investigation 2</p> <p>Making Connections <u>Key Concept:</u> Electric circuits require a complete loop through which an electric current can pass.</p>	<p>Part 1 Focus Questions How can you get electricity from a source (D-cell) to a receiver (bulb)?</p> <p>What is a circuit?</p> <p>Lighting A Bulb Students identify the flow of electricity through a simple circuit by connecting the critical contact points.</p>	<p>Part 2 Focus Questions How is the motor circuit like the light bulb circuit? How is it different?</p> <p>What does a switch do in a circuit?</p> <p>Making a Motor Run</p> <ul style="list-style-type: none"> • Students build a circuit using a motor and a circuit board. • Students explore open and closed circuits. 	<p>Part 3 Focus Question What other materials will electricity flow through?</p> <p>Finding Insulators and Conductors Students will test for insulators and conductors around the classroom using a circuit board.</p>	<p>Part 4 Focus Questions</p> <p>Investigating Mystery Circuits Students work with mystery boards to reinforce the conductor concept and check their understanding of how electricity flows through a circuit.</p>
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<p>Investigation 3</p> <p>Advanced Connections</p> <p><u>Key Concept:</u></p> <ul style="list-style-type: none"> In a series circuit, current follows only one pathway through all the components. A parallel circuit has two or more components, each with their own pathway. 	<p>Part 1</p> <p>Focus Question</p> <p>What happens when more bulbs and/or D-cells are added to a series circuit?</p> <p>Building Series Circuits</p> <p>Students observe differences in bulb brightness when adding extra bulbs and/or D-cells to a series circuit.</p>	<p>Part 2</p> <p>Focus Question</p> <p>What happens when more bulbs and/or D-cells are added to a parallel circuit?</p> <p>Building Parallel Circuits</p> <ul style="list-style-type: none"> Students observe differences in bulb brightness when adding extra bulbs and/or D-cells to a parallel circuit. Students use bulb brightness to compare the differences between series and parallel circuits. 	<p>Part 3</p> <p>Focus Question</p> <p>Which type of circuit, series or parallel, is best for lighting several bulbs at a time?</p> <p>Solving the String-of-Lights Problem</p> <p>Students create series and parallel circuits with multiple bulbs and discover what circuit works best for a string of lights.</p>	
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<p>Investigation 4</p> <p>Current Attractions</p> <p><u>Key Concept:</u> Electromagnetism is magnetism created by current flowing through a conductor.</p>	<p>Part 1</p> <p>Focus Question How do we use electricity to turn a temporary magnet on and off?</p> <p>Building An Electromagnet Students build an electromagnet using wire, steel core and a D-cell.</p>	<p>Part 2</p> <p>Focus Question How does the number of winds of wire around the core affect the strength of the magnetism?</p> <p>Changing Number of Winds Students change the number of winds of wire around the core to make an electromagnet stronger or weaker.</p>	<p>Part 3</p> <p>Focus Question How can the strength of an electromagnet be changed?</p> <p>Investigating More Electromagnets Students manipulate variables that can change the strength of an electromagnet, i.e., wire gauge, number of D-cells, tighter coils.</p>	
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<p>Investigation 5</p> <p>Click It <u>Key Concept:</u> Magnetism and electricity have technological applications to modify or solve human problems.</p>	<p>Part 1 Focus Question How can the interaction of magnetism and electricity be used to create a useful tool?</p> <p>Reinventing the Telegraph Students apply their knowledge of circuitry and electromagnetism to build a telegraph.</p>	<p>Part 2 Focus Question What are other ways can we enhance the telegraph communication system?</p> <p>Sending Messages Long-Distance Students hook up two telegraphs to send messages from one group to another.</p>	<p>Part 3 Focus Question</p> <p>Choosing Your Own Investigation Students review magnetism and electricity and identify an investigation they would like to investigate. They present results of their project to the class.</p>	
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