

MAGNETISM AND ELECTRICITY MODULE MATRIX

SYNOPSIS	CA PHYSICAL SCIENCES STANDARDS	CA I&E STANDARDS	CONCEPTS	READING AND WRITING	ASSESSMENT
<p>1. THE FORCE</p> <p>Students investigate the properties of magnets. They construct a simple compass and use it to detect magnetic effects. They investigate the strength of the force of attraction by graphing data to look for patterns of interaction.</p>	<p>PS1b Build a simple compass and use it to detect magnetic effects, including Earth's magnetic field.</p> <p>PS1f Magnets have two poles (north and south), and that like poles repel each other while unlike poles attract each other.</p>	<p>I&E6c Formulate/justify predictions.</p> <p>I&E6d Conduct multiple trials/draw conclusions.</p> <p>I&E6e Construct/interpret graphs.</p> <p>I&E6f Follow written instructions.</p>	<ul style="list-style-type: none"> Only iron sticks to a magnet. Magnetism can be induced in iron. Magnets have two poles. Like poles repel; opposite poles attract. Magnets display forces of attraction and repulsion that decrease with distance. A compass is a magnet used to detect magnetic fields, including Earth's. 	<ul style="list-style-type: none"> <i>When Magnet Meets Magnet</i> <i>Magnificent Magnetic Models</i> <i>Make a Magnetic Compass</i> <i>Summary: The Force</i> Science Notebook: Students describe interactions, record and analyze data, and explain relationships. 	<p>Pretest</p> <p>Embedded Assessment</p> <ul style="list-style-type: none"> Science Notebook sheets Response sheet Teacher observation <p>Benchmark Assessment</p> <ul style="list-style-type: none"> I-Check 1
<p>2. MAKING CONNECTIONS</p> <p>Students investigate current electricity and circuits, the pathways through which electricity flows. They observe electric energy being converted to heat, light, and motion. They work with electrically charged objects and observe their behavior.</p>	<p>PS1a Design and build simple series and parallel circuits by using components such as wires, batteries, and bulbs.</p> <p>PS1e Electrically charged objects attract or repel each other.</p> <p>PS1g Electrical energy can be converted to heat, light, and motion.</p>	<p>I&E6c Formulate/justify predictions.</p>	<ul style="list-style-type: none"> A circuit is a pathway on which electric current flows. Lightbulbs convert electric energy into heat and light energy. Motors convert electric energy into motion energy when placed in a closed circuit. Conductors complete circuits and allow the flow of electric current; insulators do not. 	<ul style="list-style-type: none"> <i>Making Static</i> <i>Edison Sees the Light</i> <i>Summary: Making Connections</i> Science Notebook: Students make schematic diagrams, record results, and write explanations. 	<p>Embedded Assessment</p> <ul style="list-style-type: none"> Science Notebook sheets Response sheet Teacher observation <p>Benchmark Assessment</p> <ul style="list-style-type: none"> I-Check 2
<p>3. ADVANCED CONNECTIONS</p> <p>Students explore series and parallel circuits and compare the functioning of the components in each circuit. They formulate and justify their predictions, based on their observations of electric energy being converted to light and motion.</p>	<p>PS1a Design and build simple series and parallel circuits by using components such as wires, batteries, and bulbs.</p> <p>PS1g Electrical energy can be converted to heat, light, and motion.</p>	<p>I&E6c Formulate/justify predictions.</p>	<ul style="list-style-type: none"> A circuit with only one pathway for current flow is a series circuit. Components "share" the electric energy. A circuit with two or more pathways for current flow is a parallel circuit. 	<ul style="list-style-type: none"> <i>Series and Parallel Circuits</i> <i>Summary: Advanced Connections</i> Science Notebook: Students make schematic diagrams and write explanations. 	<p>Embedded Assessment</p> <ul style="list-style-type: none"> Science Notebook sheets Response sheet <p>Benchmark Assessment</p> <ul style="list-style-type: none"> I-Check 3
<p>4. CURRENT ATTRACTIONS</p> <p>Students learn how to use electricity to make an electromagnet. They explore the variables that influence the strength of the magnetism produced by their electromagnets.</p>	<p>PS1c Electric currents produce magnetic fields, which can be used to build a simple electromagnet.</p>	<p>I&E6a Differentiate observation from inference.</p> <p>I&E6b Measure/estimate properties of objects.</p> <p>I&E6c Formulate/justify predictions.</p> <p>I&E6d Conduct multiple trials/draw conclusions.</p> <p>I&E6e Construct/interpret graphs.</p> <p>I&E6f Follow written instructions.</p>	<ul style="list-style-type: none"> A core of iron or steel becomes an electromagnet when electricity flows through a coil of insulated wire surrounding the core. There are many ways to change the strength of an electromagnet, including changing the number of winds of wire around the core. 	<ul style="list-style-type: none"> <i>Electricity = Magnetism: Oersted's Discovery</i> <i>How Electromagnetism Stopped a War</i> <i>Summary: Current Attractions</i> Science Notebook: Students record data from multiple experiments and graph their results. 	<p>Embedded Assessment</p> <ul style="list-style-type: none"> Teacher observation Response sheet Science Notebook sheets <p>Benchmark Assessment</p> <ul style="list-style-type: none"> I-Check 4
<p>5. CLICK IT</p> <p>Students use all the concepts they have learned to build a simple telegraph system. The last part of the investigation asks students to use their inquiry skills to design, conduct, and report their own investigations.</p>	<p>PS1c Electric currents produce magnetic fields, which can be used to build a simple electromagnet.</p> <p>PS1d Electromagnets play a role in the construction of electric motors, electric generators, and simple devices, such as doorbells and earphones.</p> <p>PS1g Electrical energy can be converted to heat, light, and motion.</p>	<p>I&E6c Formulate/justify predictions.</p> <p>I&E6d Conduct multiple trials/draw conclusions.</p>	<ul style="list-style-type: none"> A telegraph is an electronic communication device that uses an electromagnet. A code is a symbolic system used for communication. A telegraph converts electric energy into motion and sound energy. 	<ul style="list-style-type: none"> <i>Morse Gets Clicking</i> <i>Electromagnets Everywhere</i> <i>Summary: Click It</i> Science Notebook: Students design and draw a long-distance telegraph circuit. 	<p>Embedded Assessment</p> <ul style="list-style-type: none"> Teacher observation Performance assessment <p>Posttest</p>