



Fourth Grade: FOSS

Physical Science - Magnetism and Electricity

Investigation Title and Synopsis	Concepts	Assessments and TE page numbers
<p>1. The Force 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>	<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 attractions and repulsion that decrease with distance • A compass is a magnet used to detect magnetic fields, including the Earth's 	<ul style="list-style-type: none"> • Pretest (pages 415-418) • Part 1 Embedded Assessment: (pages 336-337)/ Science Notebook Sheet 1 <i>Magnets and Objects</i> (page 231)/Science Notebook Sheet 2 <i>Detecting Iron</i> (page 232) • Part 1 Embedded Assessment: continued (pages 338-339)/Science Notebook Sheet 4 <i>When Magnet Meets Magnet</i> (page 234) • Part 2 Embedded Assessment: (pages 340-341)/ Science Notebook Sheet 6 <i>The Force</i> (page 236) • Part 4 Embedded Assessment: (pages 344-345)/ Science Notebook Sheet 7 <i>Detecting Magnets</i> (page 237) • Benchmark Assessment I-Check 1 (pages 419-424)
<p>2. Making Connections 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>	<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"> • Part 1 Embedded Assessment: continued (pages 346-347)/Science Notebook Sheet 8 <i>Charge</i> (page 238) • Part 2 Embedded Assessment: (pages 348-349)/ Science Notebook Sheet 9 <i>Lighting Bulbs</i> (page 239) • Part 3 Embedded Assessment: (pages 350-351)/ Science Notebook Sheet 11 <i>Response Sheet Making Connections</i> (page 241) • Part 4 Embedded Assessment: (pages 352-353)/ Science Notebook Sheet 12 <i>Conductors and Insulators</i> (page 242) • Part 5 Embedded Assessment: (pages 354-355)/ Science Notebook Sheet 13 <i>Mystery Boards</i> (page 243) • Benchmark Assessment I-Check 2 (pages 425-427)

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<p>3. Advanced Connections 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>	<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"> • Part 1 Embedded Assessment: (pages 356-357)/ Science Notebook Sheet 15 <i>Two Bulbs in Series</i> (page 245) • Part 2 Embedded Assessment: (pages 358-359)/ Science Notebook Sheet 19 <i>Response Sheet-Advanced Connections</i> (page 249) • Part 3 Embedded Assessment: (pages 360-361)/ Science Notebook Sheet 20 <i>Reccommendation to the Board</i> (page 250) • Benchmark Assessment I-Check 3 (pages 428-432)
<p>4. Current Attractions 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>	<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"> • Part 1 Embedded Assessment: Building an Electromagnet (page 362) • Part 2 Embedded Assessment: (pages 363-365) Science Notebook Sheet 21 <i>Winding Electromagnets</i> (page 251) /Science Notebook Sheet 22 <i>Response Sheet Current Attractions</i> (page 252) • Part 3 Embedded Assessment: More Electromagnets (page 366) • Benchmark Assessment I-Check 4 (pages 433-434)
<p>5. Click It 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>	<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"> • Part 1 Embedded Assessment: (pages 367) <i>Reinventing the Telegraph</i> (page 324) • Part 2 Embedded Assessment: (pages 368-369)/ Science Notebook Sheet 27 <i>Long Distance Telegraph</i> (page 257) • Part 3 Embedded Assessment: (pages 370-371)/ Science Notebook Sheet 29 (page 259) • Posttest (pages 415-418)