

Unit 2—Electricity and Magnetism (FOSS® Magnetism & Electricity)

Essential Question: What are the properties of electricity and magnetism?

Major Understandings: *Quoted from New York State Performance Indicators*

PS 3.1 Observe and describe properties of materials, using appropriate tools.

- 3.1c Objects have properties that can be observed, described, and/or measured: length, width, volume, size, shape, mass or weight, temperature, texture, flexibility, reflectiveness of light.
- 3.1e The material(s) an object is made up of determine some specific properties of the object (sink/float, conductivity, magnetism). Properties can be observed or measured with tools such as hand lenses, metric rulers, thermometers, balances, magnets, circuit testers, and graduated cylinders.
- 3.1f Objects and/or materials can be sorted or classified according to their properties.

PS 4.1 Describe a variety of forms of energy (e.g., heat, chemical, light) and the changes that occur in objects when they interact with those forms of energy.

- 4.1a Energy exists in various forms: heat, electric, sound, chemical, mechanical, light.
- 4.1b Energy can be transferred from one place to another.
- 4.1c Some materials transfer energy better than others (heat and electricity).
- 4.1d Energy and matter interact: water is evaporated by the Sun's heat; a bulb is lighted by means of electrical current; a musical instrument is played to produce a sound; dark colors may absorb light, light colors may reflect light.
- 4.1e Electricity travels in a closed circuit.
- 4.1g Interactions with forms of energy can be either helpful or harmful.

PS 5.1 Describe the effects of common forces (pushes and pulls) of objects, such as those caused by gravity, magnetism, and mechanical forces.

- 5.1e Magnetism is a force that may attract or repel certain materials.

PS 5.2 Describe how forces can operate across distances.

- 5.2a The forces of gravity and magnetism can affect objects through gases, liquids, and solids.
- 5.2b The force of magnetism on objects decreases as distance increases.

Grade 4

WEEK 1	Lesson 1 (45 min) Objective(s): Survey/Pre-assessment		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e, g; 5.1e; 5.2a, b	
	Advanced Planning / Notes to Teachers – Note: Administration of the Survey should be a few days BEFORE the start of the unit. – Teacher Guide, Benchmark Assessment Folio, pp. 1-25, 72. – Download optional tool: Benchmark and I-Check Assessment coding sheets at www.fossweb.com/NYC . – Kit preparation: see Teacher Guide, Materials, pp 1-6 and Teacher Preparation Video or DVD (or view at www.fossweb.com/NYC). – Note: see Teacher Guide, Materials, p. 3 for Materials Supplied by the Teacher and Materials from the M&E Tool Kit.		Investigation/Activity – Benchmark Assessment Packet, Survey/Posttest pages 1-7 – Letter to Parents, Teacher Sheet No.1	
	Lesson 2 (45 min) Objective(s): <ul style="list-style-type: none"> • Magnets stick to iron and steel. • Magnets attract or repel one another. • The magnetic force causes magnetic interactions. • A force is a push or a pull. 		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 5.1e; 5.2a	
	Advanced Planning/ Notes to Teachers – Teacher Guide Inv. 1: The Force, pp. 8-10, especially #5 “ <i>Avoid Magnetic Hazards</i> ” – www.fossweb.com – Check website for interactive simulations, to write questions to a scientist, for teaching tips, and other websites to support teaching Measurement		Investigation/Activity – Investigation1: <i>The Force</i> Part 1: <i>Investigating Magnets and Materials, # 1-15</i> – Teacher Guide pages 11-14 – Teacher Sheet No. 2 – Student Sheet No. 3 – Assessment Chart for Investigation 1, Part 1 – Teacher Observation	
			Homework/Extra Practice	
			Homework/Extra Practice	

Grade 4

WEEK 1 (continued)	<p>Lesson 3 (45 min) Objective(s):</p> <ul style="list-style-type: none"> • Magnets stick to iron and steel. • Magnets attract or repel one another. • The magnetic force causes magnetic interactions. • A force is a push or a pull. 		<p>Alignment with NYS Core Curriculum: PS 3.1c, e, f; 5.1e; 5.2a, b</p>
	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Inv. 1: <i>The Force</i>, pages 8-10 – Teacher Guide Science Stories folio, pp. 1-3 	<p>Investigation/Activity</p> <ul style="list-style-type: none"> – Investigation1: <i>The Force</i> Part 1: <i>Investigating Magnets and Materials</i>, # 16-23 – Teacher Guide pages 14-16 – Student Sheet No. 3 – Assessment Chart for Investigation 1, Part 1 – Teacher Observation – <i>FOSS Science Stories: Magnus Gets Stuck</i>, pages 1-4 	<p>Homework/Extra Practice</p> <p>Home School Connection Student Sheet No. 34</p>
	<p>Lesson 4 (45 min) Objective(s):</p> <ul style="list-style-type: none"> • The magnetic force causes magnetic interactions. • The magnetic force of attraction between two magnets decreases with distance. • Magnetism can be induced in a piece of steel that is close to or touching a magnet. 		<p>Alignment with NYS Core Curriculum: PS 3.1c, e, f; 5.1e; 5.2a, b</p>
	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Inv. 1: <i>The Force</i>, p. 17 <i>Vignette: Landmark Magnetic Discoveries</i> – Teacher Guide Inv. 1: <i>The Force</i>, pp. 18-19 	<p>Investigation/Activity</p> <ul style="list-style-type: none"> – Investigation1: <i>The Force</i> Part 2: <i>Investigating More Magnetic Properties</i>, # 1-11 – Teacher Guide pages 20-22 – Response Sheet No. 4 – Assessment Chart for Investigation 1, Part 2 – Response Sheet-Magnets 	<p>Homework/Extra Practice</p>

Grade 4

WEEK 2	Lesson 5 (45 min) Objective(s): <ul style="list-style-type: none"> The magnetic force causes magnetic interactions. The magnetic force of attraction between two magnets decreases with distance. Magnetism can be induced in a piece of steel that is close to or touching a magnet. 		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 5.1e; 5.2a, b
	Advanced Planning/ Notes to Teachers – Teacher Guide Inv. 1: <i>The Force</i> , pp. 18-19 – Teacher Guide Science Stories folio, pp. 4-5	Investigation/Activity – Investigation1: <i>The Force</i> Part 2: <i>Investigating More Magnetic Properties</i> , # 12-14 – Teacher Guide page 22 – <i>FOSS Science Stories: Magnificent Magnetic Models</i> , page 5	Homework/Extra Practice Math Extension, Student Sheet No. 29
	Lesson 6 (45 min) Objective(s): <ul style="list-style-type: none"> The magnetic force of attraction between two magnets decreases with distance. Magnetic fields act through cardboard. 		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 5.1e; 5.2a, b
	Advanced Planning/ Notes to Teachers – Teacher Guide Inv. 1: <i>The Force</i> , pp 23-24 – Plan for recording and graphing data. Review Teacher Preparation Video or DVD (or view at www.fossweb.com/NYC)	Investigation/Activity – Investigation1: <i>The Force</i> Part 3: <i>Breaking the Force</i> , # 1-7 – Teacher Guide pages 25-26	Homework/Extra Practice

Grade 4

WEEK 2 (continued)	Lesson 7 (45 min) Objective(s): <ul style="list-style-type: none"> The magnetic force of attraction between two magnets decreases with distance. Magnetic fields act through cardboard. 	Alignment with NYS Core Curriculum: PS 3.1c, e, f; 5.1e; 5.2a, b		
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> Teacher Guide Inv. 1: <i>The Force</i>, pp. 23-24 Plan for recording and graphing data. Review Teacher Preparation Video or DVD (or view at www.fossweb.com/NYC) Prepare magnet boxes and iron filings bags for Part 4 if needed. 	Investigation/Activity <ul style="list-style-type: none"> Investigation1: <i>The Force</i> Part 3: <i>Breaking the Force</i>, # 8-19 Teacher Guide pages 26-29 Student Sheet No. 5 Assessment Chart for Investigation 1, Part 3 – Teacher Observation 	Homework/Extra Practice Using your graph on Student Sheet 5, write four statements to describe points on the graph. First use specific data points, then make general conclusions. For example: “When there was 1 spacer between the magnets it took 10 washers to break the force of attraction between the magnets. When there were 4 spacers.... The greater the number of spacers, the fewer washers needed to break the force of attraction.”	
	Lesson 8 (45 min) Objective(s): <ul style="list-style-type: none"> Magnetism can be induced in a piece of steel that is close to or touching a magnet. Compasses, iron filings and iron objects can detect a magnetic field. 	Alignment with NYS Core Curriculum: PS 3.1c, e, f; 5.1e; 5.2a, b		
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> Teacher Guide Inv. 1: <i>The Force</i>, pp. 30-31 Gather assorted magnets (optional) to add to this investigation. Teacher Guide Science Stories folio, pp. 6-9 	Investigation/Activity <ul style="list-style-type: none"> Investigation1: <i>The Force</i> Part 4: <i>Detecting the Force of Magnetism</i>, # 1-10 Teacher Guide pages 32-34 Student Sheet No. 6 Assessment Chart for Investigation 1, Part 4 – Teacher Observation 	Homework/Extra Practice	

Grade 4

WEEK 3	Lesson 9 (45 min) Objective(s): <ul style="list-style-type: none"> • Magnetism can be induced in a piece of steel that is close to or touching a magnet. • Compasses, iron filings and iron objects can detect a magnetic field. 		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 5.1e; 5.2a, b
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> – Teacher Guide Inv. 1: The Force, pp. 30-31 – Teacher Guide Science Stories folio, pp. 6-9 	Investigation/Activity <ul style="list-style-type: none"> – Investigation1: <i>The Force</i> Part 4: <i>Detecting the Force of Magnetism</i>, # 11-13 – Teacher Guide page 34 – <i>FOSS Science Stories: How Magnets Interact</i>, page 6 and <i>Make a Compass</i>, pages 7-9 	Homework/Extra Practice Make a chart showing as many different uses of a <u>magnet</u> as you can. Bring your list to class to discuss with your group
	Lesson 10 (45 min) Objective(s): <ul style="list-style-type: none"> • Magnets stick to iron and steel. • Magnets attract or repel one another. • The magnetic force causes magnetic interactions. • The magnetic force of attraction between two magnets decreases with distance. • Magnetism can be induced in a piece of steel that is close to or touching a magnet. 		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 5.1e; 5.2a, b
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> – Teacher Guide, Benchmark Assessment Folio, pp. 26-35, 72 – Plan Assessment Review time with class after teacher assessment coding. – Prepare connecting wires (20 gauge) for Investigation 2, Parts 1 (15cm) & 3 (30 cm) if not yet completed. 	Investigation/Activity Benchmark Assessment Packet, Investigation 1 I-Check, pages 1-5	Homework/Extra Practice

Grade 4

WEEK 3 (continued)	Lesson 11 (45 min) Objective(s): <ul style="list-style-type: none"> • A D-cell is a source of electrical energy. • A bulb is an energy receiver that produces light. • A circuit is a pathway through which electric current flows. 	Alignment with NYS Core Curriculum: PS 4.1a-e		
	Advanced Planning/ Notes to Teachers –Teacher Guide Inv. 2: <i>Making Connections</i> , pp. 8-9 – “Mystery Boards” need to be prepared for Part 4 (Lesson 15) of this investigation. See pp. 27-28, Teacher Sheet No. 13-14 and view Teacher Preparation Video or DVD (or view at www.fossweb.com/NYC)	Investigation/Activity <ul style="list-style-type: none"> – Investigation 2: <i>Making Connections</i> Part 1: <i>Lighting a Bulb</i>, # 1-16 – Teacher Guide pages 10-13 – Student Sheet No. 7 – Assessment Chart for Investigation 2, Part 1 – Student Sheet – The Flow of Electricity 	Homework/Extra Practice Home School Connection Student Sheet No. 35	
	Lesson 12 (45 min) Objective(s): <ul style="list-style-type: none"> • A motor is an energy receiver that produces motion. • A switch is a device that opens and closes a circuit. • A schematic diagram is a representation of a circuit that is used for recording and communicating with others. 	Alignment with NYS Core Curriculum: PS 4.1a-e		
	Advanced Planning/ Notes to Teachers – Teacher Guide Inv. 2: <i>Making Connections</i> , pp 14-15.	Investigation/Activity <ul style="list-style-type: none"> – Investigation 2: <i>Making Connections</i> Part 2: <i>Making a Motor Run</i>, # 1-18 – Teacher Guide pages 16-19 – Student Sheet No. 8 – Response Sheet No. 9 – Assessment Chart for Investigation 2, Part 2 – Response Sheet – Bulbs 	Homework/Extra Practice	

Grade 4

WEEK 4	Lesson 13 (45 min) Objective(s): <ul style="list-style-type: none"> • Conductors are materials that allow the flow of electricity. • Insulators are materials that do not allow the flow of electricity. • All metals are conductors. 		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> – Teacher Guide Inv. 2: <i>Making Connections</i>, pp. 20-21 – Teacher Guide Science Stories folio, pp. 10-11 	Investigation/Activity <ul style="list-style-type: none"> – Investigation 2: <i>Making Connections</i> Part 3: <i>Finding Conductors and Insulators</i>, # 1-11 – Teacher Guide pages 22-24 – Student Sheet No. 10 – Assessment Chart for Investigation 2, Part 3 – Teacher Observation 	Homework/Extra Practice Math Extension, Student Sheet No. 30
	Lesson 14 (45 min) Objective(s): <ul style="list-style-type: none"> • Conductors are materials that allow the flow of electricity. • Insulators are materials that do not allow the flow of electricity. • All metals are conductors. 		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> – Teacher Guide Inv. 2: <i>Making Connections</i>, pp. 20-21 – Teacher Guide Science Stories folio, pp. 10-11 	Investigation/Activity <ul style="list-style-type: none"> – Investigation 2: <i>Making Connections</i> Part 3: <i>Finding Conductors and Insulators</i>, # 12-14 – Teacher Guide page 25 – FOSS Science Stories: <i>Making Static</i>, pages 10-11 and <i>A Fictional Interview with Benjamin Franklin</i>, pages 12-13 	Homework/Extra Practice

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WEEK 4 (continued)	<p>Lesson 15 (45 min) Objective(s):</p> <ul style="list-style-type: none"> • A circuit is a pathway through which electric current flows. • A closed circuit allows electricity to flow; an open circuit does not. • Conductors are materials that allow the flow of electricity; insulators are materials that do not allow the flow of electricity. • A switch is a device that opens and closes a circuit. 		<p>Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e</p>
	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Inv. 2: <i>Making Connections</i>, pp. 26-28 – Teacher Guide Science Stories folio, pp. 12-13 	<p>Investigation/Activity</p> <ul style="list-style-type: none"> – Investigation 2: <i>Making Connections</i> Part 4: <i>Investigating Mystery Circuits</i>, # 1-5 – Teacher Guide page 29 – Student Sheets Nos. 11-12 – Assessment Chart for Investigation 2, Part 4 – Mystery Circuits, Making Connections – <i>FOSS Science Stories: Two Reference Sources About Edison</i>, pages 14-15 	<p>Homework/Extra Practice</p>
	<p>Lesson 16 (45 min) Objective(s):</p> <ul style="list-style-type: none"> • A circuit is a pathway through which electric current flows. • A closed circuit allows electricity to flow; an open circuit does not. • Conductors are materials that allow the flow of electricity; insulators are materials that do not allow the flow of electricity. • A switch is a device that opens and closes a circuit. 		<p>Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e</p>
	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide, Benchmark Assessment Folio, pp. 36-47, 72 – Plan Assessment Review time with class after teacher assessment coding. – Check D-cells and inventory wires for use in Investigation 3. Replace if necessary. 	<p>Investigation/Activity</p> <p>Benchmark Assessment Packet, Investigation 2 I-Check, pages 1-6</p>	<p>Homework/Extra Practice</p> <p>Investigate in your home which light is used the most often. Make a chart of the times it is turned on. How many hours is it on in a 24-hour day? What kind of light is it? Ask an adult to help you find out what kind of light bulb it uses.</p>

Grade 4

WEEK 5	Lesson 17 (45 min) Objective(s): <ul style="list-style-type: none"> • An electric circuit is a pathway along which electricity flows. • A circuit with only one pathway for current flow is a series circuit. • Cells in series must be oriented in the same direction in order to work. 		Alignment with NYS Core Curriculum: PS 4.1a-e		
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> – Teacher Guide Inv. 3: Advanced Connections, pp. 10-11 – Teacher Guide Science Stories folio, pp. 14-15 	Investigation/Activity <ul style="list-style-type: none"> – Investigation 3: <i>Advanced Connections</i> Part 1: <i>Building Series Circuits</i>, # 1-13 – Teacher Guide pages 12-14 – Student Sheet No. 15 (Part 1 & 2) – Assessment Chart for Investigation 3, Part 1 – Informal Observation 		Homework/Extra Practice Home School Connection Student Sheet No. 36	
	Lesson 18 (45 min) Objective(s): <ul style="list-style-type: none"> • An electric circuit is a pathway along which electricity flows. • A circuit with only one pathway for current flow is a series circuit. • Cells in series must be oriented in the same direction in order to work. 		Alignment with NYS Core Curriculum:		
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> – Teacher Guide Inv. 3: Advanced Connections, pp. 10-11 – Teacher Guide Science Stories folio, pp. 14-15 	Investigation/Activity <ul style="list-style-type: none"> – Investigation 3: <i>Advanced Connections</i> Part 1: <i>Building Series Circuits</i>, # 14-16 – Teacher Guide page 15 – <i>FOSS Science Stories: Illuminating Teamwork</i>, pages 16-19 		Homework/Extra Practice	

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WEEK 5 (continued)	Lesson 19 (45 min) Objective(s): <ul style="list-style-type: none"> • An electric circuit is a pathway along which electricity flows. • A circuit that splits into two or more pathways before coming together at the battery is a parallel circuit. • Components in a parallel circuit have a direct pathway to the energy source. 		Alignment with NYS Core Curriculum: PS 4.1a-e
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> – Teacher Guide Inv. 3: <i>Advanced Connections</i>, pp. 16-17 – Teacher Guide Science Stories folio, pp. 14-15 	Investigation/Activity <ul style="list-style-type: none"> – Investigation 3: <i>Advanced Connections</i> Part 2: <i>Building Parallel Circuits</i>, # 1-7 – Teacher Guide pages 18-20 – Student Sheet No. 15 (Part 3 & 4) – <i>FOSS Science Stories: Illuminating Teamwork</i>, pages 16-19 	Homework/Extra Practice Math Extension, Student Sheet No. 31
	Lesson 20 (45 min) Objective(s): <ul style="list-style-type: none"> • An electric circuit is a pathway along which electricity flows. • A circuit that splits into two or more pathways before coming together at the battery is a parallel circuit. • Components in a parallel circuit have a direct pathway to the energy source. 		Alignment with NYS Core Curriculum: PS 4.1a-e, g
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> – Teacher Guide Inv. 3: <i>Advanced Connections</i>, pp. 16-17 – Teacher Guide Science Stories folio, pp. 16-17 	Investigation/Activity <ul style="list-style-type: none"> – Investigation 3: <i>Advanced Connections</i> Part 2: <i>Building Parallel Circuits</i>, # 8-14 – Teacher Guide pages 18-20 – Response Sheet No. 16 – Assessment Chart for Investigation 3, Part 2 – Circuit Design – <i>FOSS Science Stories: A True Pioneer: Lewis Latimer</i>, page 20 	Homework/Extra Practice

Grade 4

WEEK 6	Lesson 21 (45 min) Objective(s): <ul style="list-style-type: none"> • An electric circuit is a pathway along which electricity flows. • A circuit with only one pathway for current flow is a series circuit. • A circuit that splits into two or more pathways before coming together at the battery is a parallel circuit. 		Alignment with NYS Core Curriculum: PS 4.1a-e, g
	Advanced Planning/ Notes to Teachers Teacher Guide Inv. 3: <i>Advanced Connections</i> , pp. 22-23	Investigation/Activity <ul style="list-style-type: none"> – Investigation 3: <i>Advanced Connections</i> Part 3: <i>Solving the String of Lights Problem</i>, # 1-12 – Teacher Guide pages 24-26 – Student Sheet No. 17 – Assessment Chart for Investigation 3, Part 3 – Teacher Observations and Student Sheet 	Homework/Extra Practice Make a graph showing how many electrical devices are used in you home at three different times of the day.
	Lesson 22 (45 min) Objective(s): <ul style="list-style-type: none"> • An electric circuit is a pathway along which electricity flows. • A circuit with only one pathway for current flow is a series circuit. • A circuit that splits into two or more pathways before coming together at the battery is a parallel circuit. 		Alignment with NYS Core Curriculum: PS 4.1a-e, g; 5.2a
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> – Teacher Guide, Benchmark Assessment Folio, pp. 48-57, 72 – Plan Assessment Review time with class after teacher assessment coding. – Prepare connecting wires (20 gauge, 15 cm) and electromagnet wires (24 gauge, 150 cm) for Investigation 4, Part 1 if not yet completed. Check D-cells (see Inv. 4, p. 10, step 6). 	Investigation/Activity Benchmark Assessment Packet, Investigation 3 I-Check, pages 1-5	Homework/Extra Practice

Grade 4

WEEK 6 (continued)	Lesson 23 (45 min) Objective(s): <ul style="list-style-type: none"> Electromagnetism is magnetism created by current flowing through a conductor. The magnetism produced by electromagnets can be turned on and off. 		Alignment with NYS Core Curriculum: PS 4.1a-e, g; 5.1e; 5.2a
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> Teacher Guide Inv. 4: <i>Current Attractions</i>, pp. 8-10 Teacher Guide Science Stories folio, pp. 18-19 	Investigation/Activity <ul style="list-style-type: none"> Investigation 4: <i>Current Attractions</i> Part 1: <i>Building an Electromagnet</i>, # 1-15 Teacher Guide pages 11-13 Assessment Chart for Investigation 4, Part 1 – Teacher Observation <i>FOSS Science Stories: From Rags to Riches: A Story of Michael Faraday</i>, pages 21-23 	Homework/Extra Practice Home School Connection Student Sheet No. 37
	Lesson 24 (45 min) Objective(s): <ul style="list-style-type: none"> Electromagnetism is magnetism created by current flowing through a conductor. Electromagnets can be turned on and off. The strength of the magnetism produced by an electromagnet can be varied. 		Alignment with NYS Core Curriculum: PS 4.1a-e, g; 5.1e; 5.2a
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> Teacher Guide Inv. 4: <i>Current Attractions</i>, pp. 14-15 Teacher Guide Science Stories folio, pp. 20-21 	Investigation/Activity <ul style="list-style-type: none"> Investigation 4: <i>Current Attractions</i> Part 2: <i>Changing Number of Winds</i>, # 1-6 Teacher Guide page 16 Student Sheet No. 18 	Homework/Extra Practice Math Extension, Student Sheet No. 32

Grade 4

WEEK 7

WEEK 7	<p>Lesson 25 (45 min) Objective(s):</p> <ul style="list-style-type: none"> • Electromagnetism is magnetism created by current flowing through a conductor. • Electromagnets can be turned on and off. • The strength of the magnetism produced by an electromagnet can be varied. 	<p>Alignment with NYS Core Curriculum: PS 4.1a-e, g; 5.1e; 5.2a</p>		
	<p>Advanced Planning/ Notes to Teachers –Teacher Guide Inv. 4: <i>Current Attractions</i>, pp. 14-15 – Teacher Guide Science Stories folio, pp. 20-21</p>	<p style="text-align: center;">Investigation/Activity</p> <ul style="list-style-type: none"> – Investigation 4: <i>Current Attractions</i> Part 2: <i>Changing Number of Winds</i>, # 7-12 – Teacher Guide pages 17-18 – Student Sheet No. 18 – Response Sheet No. 19 – Assessment Chart for Investigation 4, Part 2 – Reverse Switch – <i>FOSS Science Stories: How Electromagnetism Stopped a War</i>, pages 24-27 		<p style="text-align: center;">Homework/Extra Practice</p>
	<p>Lesson 26 (45 min) Objective(s):</p> <ul style="list-style-type: none"> • Electromagnetism is magnetism created by current flowing through a conductor. • Electromagnets can be turned on and off. • The strength of the magnetism produced by an electromagnet can be varied. 	<p>Alignment with NYS Core Curriculum: PS 4.1a-e, g; 5.1e; 5.2a</p>		
	<p>Advanced Planning/ Notes to Teachers – Teacher Guide Inv. 4: <i>Current Attractions</i>, pp. 19-20 – Teacher Guide Science Stories folio, pp. 22-25</p>	<p style="text-align: center;">Investigation/Activity</p> <ul style="list-style-type: none"> – Investigation 4: <i>Current Attractions</i> Part 3: <i>Investigating More Electromagnets</i>, # 1-11 – Teacher Guide pages 21-22 – Student Sheet No. 20 – Assessment Chart for Investigation 4, Part 3 – Teacher Observation and Electromagnet Investigation – <i>FOSS Science Stories: Magnets and Electricity in Your Life</i>, pages 28-33 		<p style="text-align: center;">Homework/Extra Practice</p> <p>We all depend on electricity. Write down ALL the ways that you used electrical power for one day this month. How would you do things without electricity? Talk to your family about what you would do if there was a “blackout” (no electricity from the power company) because of a storm or equipment failure.</p>

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WEEK 7 (continued)	Lesson 27 (45 min) Objective(s): <ul style="list-style-type: none"> • Electromagnetism is magnetism created by current flowing through a conductor. • Electromagnets can be turned on and off. • The strength of the magnetism produced by an electromagnet can be varied. 		Alignment with NYS Core Curriculum: PS 3.1e; 4.1a-e, g; 5.1e; 5.2a		
	Advanced Planning/ Notes to Teachers – Teacher Guide, Benchmark Assessment Folio, pp. 58-71, 72 – Plan Assessment Review time with class after teacher assessment coding. – Check D-cells and steel strips for Inv. 5: <i>Click It</i> , pp. 8-9.	Investigation/Activity Benchmark Assessment Packet, Investigation 4 I-Check, pages 1-7		Homework/Extra Practice	
	Lesson 28 (45 min) Objective(s): <ul style="list-style-type: none"> • Science and technology are closely related. Science is knowledge of the natural world; technology is using scientific knowledge to modify the world to solve human problems. • A circuit is a pathway through which electric current flows. • Electromagnetism is magnetism created by current flow through a conductor. 		Alignment with NYS Core Curriculum: PS 4.1a-e, g; 5.1e; 5.2a, b		
	Advanced Planning/ Notes to Teachers Teacher Guide Inv. 5: <i>Click It</i> , pp. 8-9	Investigation/Activity <ul style="list-style-type: none"> – Investigation 5: <i>Click It</i> Part 1: <i>Reinventing the Telegraph</i>, # 1-13 – Teacher Guide pages 10-14 – Student Sheet No. 21 – Assessment Chart for Investigation 5, Part 1 – Teacher Observation 		Homework/Extra Practice Research <u>sources of energy</u> that were used before electricity to light homes, heat spaces, and do the things that we rely on electricity for today.	

Grade 4

WEEK 8	Lesson 29 (45 min) Objective(s): <ul style="list-style-type: none"> Science and technology are closely related. Science is knowledge of the natural world; technology is using scientific knowledge to modify the world to solve human problems. A circuit is a pathway through which electric current flows. Electromagnetism is magnetism created by current flow through a conductor. 		Alignment with NYS Core Curriculum: PS 4.1a-e, g; 5.1e; 5.2a, b
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> Teacher Guide Inv. 5: <i>Click It</i>, pp. 15-16 Teacher Guide Science Stories folio, pp. 26-27 	Investigation/Activity <ul style="list-style-type: none"> Investigation 5: <i>Click It</i> Part 2: <i>Sending Messages Long Distance</i>, # 1-10 Teacher Guide pages 17-19 Student Sheet No. 21 Assessment Chart for Investigation 5, Part 1 – Teacher Observation <i>FOSS Science Stories: Magnets and Electricity in Your Life</i>, pages 28-33 	Homework/Extra Practice
	Lesson 30 (45 min) Objective(s): <ul style="list-style-type: none"> Science and technology are closely related. Science is knowledge of the natural world; technology is using scientific knowledge to modify the world to solve human problems. A circuit is a pathway through which electric current flows. Electromagnetism is magnetism created by current flow through a conductor. 		Alignment with NYS Core Curriculum: PS 4.1a-e, g; 5.1e; 5.2a, b
	Advanced Planning/ Notes to Teachers <ul style="list-style-type: none"> Teacher Guide Inv. 5: <i>Click It</i>, pp. 15-16 Teacher Guide Science Stories folio, pp. 26-27 	Investigation/Activity <ul style="list-style-type: none"> Investigation 5: <i>Click It</i> Part 2: <i>Sending Messages Long Distance</i>, # 11-13 Teacher Guide page 20 Assessment Chart for Investigation 5, Part 2 – Teacher Observation <i>FOSS Science Stories: Morse Gets Clicking</i>, pages 34-37 	Homework/Extra Practice Become a <u>safety engineer</u> . Make a poster that shows <u>safety rules</u> to follow when using something that uses “batteries” or electricity, or rules to follow during an electrical storm.

Grade 4

WEEK 8 (continued)	Lesson 31 (optional) (45 min) <i>FOSS® encourages the use of student projects in Choosing Your Own Investigation. Students develop investigation plans, do systematic work to complete investigations and support conclusions with evidence. While it may not be possible to complete projects in every FOSS® unit, creative management and interdisciplinary opportunities will allow students to gain experience in manageable independent projects. In Magnetism & Electricity FOUR LESSONS may be incorporated to complete Investigation 5: Click It, Part 3: Choosing Your Own Investigation. If time is not available for Lessons 31 – 34, procede to Lesson 35.</i>		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e, g; 5.1e; 5.2a, b
	Objective(s): Apply electricity and magnetism concepts.		
	Advanced Planning/ Notes to Teachers Teacher Guide Inv. 5: <i>Click It</i> , pp. 21-23	Investigation/Activity <ul style="list-style-type: none"> – Investigation 5: <i>Click It</i> Part 3: <i>Choosing Your Own Investigation</i>, # 1-4 – Teacher Guide pages 24 – Student Sheets Nos. 23-25 – Assessment Chart for Investigation 5, Part 3 	Homework/Extra Practice Create a vehicle that moves using magnetism.
	Lesson 32 (optional) (45 min) Objective(s): Apply electricity and magnetism concepts.	Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e, g; 5.1e; 5.2a, b	
Advanced Planning/ Notes to Teachers Teacher Guide Inv. 5: <i>Click It</i> , pp. 21-23	Investigation/Activity <ul style="list-style-type: none"> – Investigation 5: <i>Click It</i> Part 3: <i>Choosing Your Own Investigation</i>, # 1-4 – Teacher Guide page 24 – Student Sheets Nos. 23-25 – Assessment Chart for Investigation 5, Part 3 	Homework/Extra Practice Use <u>static electricity</u> to pick up little pieces of paper. Comb your hair or rub a balloon on your sweater until it is charged. Count how many pieces of paper you can lift.	

Grade 4

WEEK 9	Lesson 33 (optional) (45 min) Objective(s): Apply electricity and magnetism concepts.		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e, g; 5.1e; 5.2a, b
	Advanced Planning/ Notes to Teachers Teacher Guide Inv. 5: <i>Click It</i> , pp. 21-23	Investigation/Activity – Investigation 5: <i>Click It</i> Part 3: <i>Choosing Your Own Investigation</i> , # 5-6 – Teacher Guide page 25 – Student Sheets Nos. 23-25 – Assessment Chart for Investigation 5, Part 3	Homework/Extra Practice Conduct an experiment to see which battery lasts the longest.
	Lesson 34 (optional) (45 min) Objective(s): Apply electricity and magnetism concepts.		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e, g; 5.1e; 5.2a, b
	Advanced Planning/ Notes to Teachers Teacher Guide Inv. 5: <i>Click It</i> , pp. 21-23	Investigation/Activity – Investigation 5: <i>Click It</i> Part 3: <i>Choosing Your Own Investigation</i> , #5-6 – Teacher Guide page 25 – Student Sheets Nos. 23-25 – Assessment Chart for Investigation 5, Part 3	Homework/Extra Practice Make a chart of ways that you can save electricity. Try to do one thing for a week. Keep a record. Report to your classmates on your success.

Grade 4

WEEK 9 (continued)	Lesson 35 (REQUIRED) (45 min) Objective(s): Apply electricity and magnetism concepts.		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e, g; 5.1e; 5.2a, b
	Advanced Planning/ Notes to Teachers – Teacher Guide, Benchmark Assessment Folio, pp. 1-25, 72 – Download optional tool: Benchmark and I-Check Assessment coding sheets at www.fossweb.com/NYC	Investigation/Activity Benchmark Assessment Packet, Survey/Posttest, pages 1-7	Homework/Extra Practice
	Lesson 36 (REQUIRED) (45 min) Objective(s): Apply electricity and magnetism concepts.		Alignment with NYS Core Curriculum: PS 3.1c, e, f; 4.1a-e, g; 5.1e; 5.2a, b
	Advanced Planning/ Notes to Teachers – Teacher Guide, Benchmark Assessment Folio, pp. 1-25, 72 – Download optional tool: Benchmark and I-Check Assessment coding sheets at www.fossweb.com/NYC	Investigation/Activity Benchmark Assessment Review (selected items)	Homework/Extra Practice