

<b>Grade: 3</b> <b>Subject: Science</b>	<b>Unit of Study: Electricity and Magnetism</b>
<b>Big Idea/Rationale</b>	Electricity and magnetism are related effects that have many useful applications in everyday life. Students explore permanent magnetism and electric circuits through free exploration and systematic investigations. They observe and compare electric and magnetic phenomena, and organize their observations.
<b>Enduring Understanding (Mastery Objective)</b>	<ul style="list-style-type: none"> <li>• Changes take place because of the transfer of energy.</li> <li>• Energy is transferred to matter through the action of forces.</li> <li>• Electricity can be used to magnetize objects, and Magnets can be used to form electricity.</li> <li>• Magnets have magnetic fields that exert forces in all directions around the magnet.</li> <li>• Electric currents are produced in generators, electric cells, and solar cells, and it can be changed into useful forms of energy.</li> <li>• Different forces are responsible for the transfer of the different forms of energy.</li> <li>• Energy is transferred to matter through the action of forces.</li> <li>• Investigate circuits that can be used to power bulbs, bells/buzzers, and small motors with dry cells.</li> <li>• Look at various objects, make predictions about whether they were magnetic, and then test their predictions.</li> <li>• Magnets attract certain materials such as iron and steel, magnets have north and south poles.</li> </ul>
<b>Essential Questions (Instructional Objective)</b>	<ul style="list-style-type: none"> <li>• How are magnetism and electrical energy related?</li> <li>• How can a magnetic field produce electricity?</li> <li>• How can an electric current produce a magnetic field?</li> <li>• How can energy be transferred from one material to another?</li> <li>• What happens to a material when energy is transferred to it?</li> </ul>
<b>Content (Subject Matter)</b>	<p><b><u>Investigation1 –Part 1:</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>The Force</u></b> <ul style="list-style-type: none"> <li>○ Students find that objects that contain iron stick to permanent magnets; other objects do not. They discover that two magnets either attract or repel one another, depending on their orientation.</li> <li>○ Magnetic force is responsible for this behavior.</li> </ul> </li> <li>• <b><u>Part 2- Investigating More Magnetic Properties</u></b> <ul style="list-style-type: none"> <li>○ Students observe that steel objects in contact with a magnet become temporarily magnetic themselves. Students find out that the magnetic force acts right through materials, with the exception of iron.</li> </ul> </li> <li>• <b><u>Part 3- Breaking The Force</u></b> <ul style="list-style-type: none"> <li>○ Students will measure the force of attraction between two magnets. They will investigate what happens to the force of</li> </ul> </li> </ul>

	<p>attraction as the distance between the two magnets increases.</p> <ul style="list-style-type: none"> <li>• <b><u>Part 4-Detecting The Force of Magnetism</u></b> <ul style="list-style-type: none"> <li>○ Students explore ways to detect the magnetic force.</li> </ul> </li> </ul> <p><b><u>Investigation – 2: Making Connections</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>Part 1- Lighting a Bulb</u></b> <ul style="list-style-type: none"> <li>○ Students explore simple electric circuits. They develop concepts about how connections must be made and how electricity flows through a circuit.</li> </ul> </li> <li>• <b><u>Part 2- Making a Motor Run</u></b> <ul style="list-style-type: none"> <li>○ Students use a circuit base to build a circuit with a D-cell and a motor. They add a switch to the circuit to control the flow of electricity.</li> </ul> </li> <li>• <b><u>Part 3- Finding Insulators and Conductors</u></b> <ul style="list-style-type: none"> <li>○ Students build a circuit to test whether objects are conductors or insulators. They search for insulators and conductors in the classroom.</li> </ul> </li> <li>• <b><u>Part 4- Investigating Mystery Circuits</u></b> <ul style="list-style-type: none"> <li>○ Students work with mystery boards to reinforce the concept of conductor. They check their understanding of how electricity flows through a circuit.</li> </ul> </li> </ul>
<p><b>Skills/ Benchmarks (CCSS Standards)</b></p>	<ul style="list-style-type: none"> <li>• 5.1.P.A.1 Display curiosity about science objects, materials, activities, and longer-term investigations in progress.</li> <li>• 5.1.4.B.1 Design and follow simple plans using systematic observations to explore questions and predictions.</li> <li>• 5.1.P.B.1 Observe, question, predict, and investigate materials, objects, and phenomena (e.g., using simple tools to crack a nut and look inside) during indoor and outdoor classroom activities and during any longer-term investigations.</li> <li>• 5.1.4.B.2 Measure, gather, evaluate, and share evidence using tools and technologies.</li> <li>• 5.1.P.B.2 Use basic science terms and topic-related science vocabulary.</li> <li>• 5.1.P.B.3 Identify and use basic tools and technology to extend exploration in conjunction with science investigations.</li> <li>• 5.1.4.B.4 Communicate and justify explanations with reasonable and logical arguments.</li> <li>• 5.1.P.C.1 Communicate with other children and adults to share observations, pursue questions, and make predictions and/or conclusions.</li> <li>• 5.1.4.C.1 Monitor and reflect on one’s own knowledge regarding how ideas change over time.</li> <li>• 5.1.P.D.1 Represent observations and work through drawing, recording data, and writing.</li> <li>• 5.1.4.D.2 Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories.</li> </ul>

	<ul style="list-style-type: none"> <li>• 5.1.4.D.3 Demonstrate how to safely use tools, instruments, and supplies.</li> <li>• 5.2.4.A.4 Categorize objects based on the ability to absorb or reflect light and conduct heat or electricity.</li> <li>• 5.2.4.D.1 Repair an electric circuit by completing a closed loop that includes wires, a battery (or batteries), and at least one other electrical component to produce observable change.</li> </ul>
<b>Materials and Resources</b>	<ul style="list-style-type: none"> <li>• This curriculum is primarily based on Full Option Science System (FOSS) Magnetism and Electricity curriculum, with multiple supplementary resources.</li> <li>• Teacher Guides: The following guides are aligned with the state standards and accompany the modules. <ul style="list-style-type: none"> <li>○ Magnetism and Electricity Teacher’s Guide</li> </ul> </li> <li>• Web Resources: <ul style="list-style-type: none"> <li>○ <a href="http://www.fossweb.com">www.fossweb.com</a></li> <li>○ Teacher Videos</li> <li>○ FOSS Magnetism and Electricity Teacher Preparation Video</li> </ul> </li> </ul>
<b>Notes</b>	