

Grade 5 Science Unit: Magnets and Motors (MAM)

Unifying Theme: Evidence, Models and Explanations

Why	What	How	
<p>Enduring Understandings</p> <ul style="list-style-type: none"> • Magnets can push and pull on each other and are attracted to all things made of iron. • An electric circuit produces a magnetic effect. • An electric motor requires the interaction of an electric current and a magnet(s). 	<p>Essential Questions</p> <ul style="list-style-type: none"> • What variables affect the strength of an electromagnet? • How are electricity and magnetism related? • What are the properties of magnets? • How does an electric motor work? 	<p>Major Indicators, Prioritized</p> <ul style="list-style-type: none"> • 5.5.12 explain that magnets exert a force that attracts or repels other magnets and attracts objects containing iron. (MLO 5.3) • 5.5.13 describe the magnetic effects of current (i.e., electromagnet) and the electric effects of magnets (i.e., motors). (MLO 5.6) • 1.5.3 use observations and select appropriate scientific information to form predictions and hypotheses. (MLO 1.1.3) • 1.5.8 analyze numerical data to identify trends and form conclusions regarding cause and effect relationships. (MLO 1.1.7) • 1.5.18 apply scientific concepts to understand a new situation. (MLO 1.3.1) • 1.5.4 recognize/develop well-designed procedures that identify dependent and independent variables within an investigation. (MLO 1.1.4) 	<p>Assessment Examples</p> <p>Pre-assessment:</p> <ul style="list-style-type: none"> • Use Getting Started- Pre-Unit Assessment on pages 7-10 of Magnets and Motors teachers’ guide. <p>Formative Assessment:</p> <ul style="list-style-type: none"> • Refer to assessment suggestions at the end of each lesson, and adapt them to include writing to inform prompts. • Given a diagram of a motor, explain the purpose of the magnet(s). <p>Summative Assessment:</p> <ul style="list-style-type: none"> • “Magnetic Mystery” developed by MCPS Science Office.

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How

Suggested Instructional Sequence	Differentiation Examples
<ul style="list-style-type: none">• Brainstorming (Scientific Inquiry)<ul style="list-style-type: none">-Explore what students already know about electricity and magnetism.• Exploring magnets and their properties (Scientific Inquiry, Critical Thinking)<ul style="list-style-type: none">-Measure the strength of magnets.-Make a simple working compass and determine which way is magnetic north.• Investigating magnetism's connection with electricity (Scientific Inquiry, Critical Thinking)<ul style="list-style-type: none">-Explore the characteristics of a switch, simple circuit and electromagnets.-Experiment with electromagnets and report the findings.• Exploring Motors (Applications, Technology)<ul style="list-style-type: none">-Turn the compass into a motor.-Build a spinning coil motor.-Take apart a commercial motor.• Generating Electricity (Application)<ul style="list-style-type: none">-Students use a motor to produce electricity. • Career Awareness<ul style="list-style-type: none">-Engage students in career awareness activities to learn about mechanical, and electrical engineers.	<p>Challenge:</p> <ul style="list-style-type: none">• Build and demonstrate a telegraph using materials provided in the Magnets and Motors kit after lesson 8. Describe how the use of science and technology helped develop the telegraph to solve communication problems in the 19th century. <p>Adjust:</p> <ul style="list-style-type: none">• Adjust the instructional lesson above by providing students with a diagram and a non-fictional text about how telegraphs were used in the 19th century. Students will make a list that communicates how magnetism and electricity are used in a telegraph. <p>ESOL:</p> <ul style="list-style-type: none">• Practice superlatives (strong/stronger/strongest) when measuring magnets.