



## High School Physics Curriculum Pacing Guide

### Electricity & Magnetism

**Crosscutting Concepts:** Patterns; Energy and Matter; Cause and Effect; Scale, Proportion, and Quantity

**Topics:** Coulomb’s Law; Transfer of Charge; Electric Potential Energy; Electric Circuits, Ohm’s Law; Electromagnetism

8-week Instructional Segment

Anchoring Phenomenon	Standard	Instructional Segments	Disciplinary Core Ideas	Science and Engineering Practices	Instructional Notes
Electrostatic demonstrations	<b>SP5a</b> <b>SP5b</b> <b>SP5c</b> <b>SP5d</b> <b>SP5e</b>	<b>Electricity and Magnetism</b>	From <a href="#">A Framework for K-12 Science Education:</a> <i>By the end of grade 12</i> <b>PS2B: Types of Interactions</b> <ul style="list-style-type: none"> <li>Newton’s Law of Universal Gravitation and Coulomb’s law provide the mathematical models to describe and predict the effects of gravitational and electrostatic forces between distant objects.</li> <li>Magnets or changing electric fields cause magnetic fields.</li> <li>Electric charges or changing magnetic fields cause electric fields.</li> <li>Attraction and repulsion between electric charges at the atomic scale explain the structure, properties, and transformations of matter.</li> </ul> <b>PS3A: Definitions of Energy</b> <ul style="list-style-type: none"> <li>At the microscopic scale, all of the different</li> </ul>	<ul style="list-style-type: none"> <li>Developing and Using Models</li> <li>Planning and Carrying Out Investigations</li> <li>Constructing Explanations</li> </ul>	Background: Be sure to follow all relevant safety procedures; power sources must be used with caution.  By the end of this unit, students are using the following language in their speaking and writing during EXPLAIN or ELABORATE. <ul style="list-style-type: none"> <li>Charged objects</li> <li>Gravitational force</li> <li>Electric force</li> <li>Electric potential energy</li> </ul>

			<p>manifestations of energy can be modeled as either motions of particles or energy stored in fields.</p> <p><b>PS3B: Conservation of Energy and Energy Transfer</b></p> <ul style="list-style-type: none"> <li>• Mathematical expressions, which quantify how the stored energy in a system depends on its configuration (e.g., relative positions of charged particles).</li> </ul> <p><b>PS3C: Relationship Between Energy and Forces</b></p> <ul style="list-style-type: none"> <li>• Force fields (gravitational, electric, and magnetic) contain energy and can transmit energy across space from one object to another.</li> </ul>		<ul style="list-style-type: none"> <li>• Conduction</li> <li>• Friction</li> <li>• Induction</li> <li>• Charge behavior</li> <li>• Electric fields</li> <li>• Magnetic fields</li> <li>• Power</li> <li>• Voltage</li> <li>• Resistance</li> <li>• Current</li> <li>• Series circuit</li> <li>• Parallel circuit</li> <li>• Ohm's Law</li> <li>• Equivalent resistance</li> <li>• Electric motors/generators</li> </ul>
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This instructional segment will connect to Modern and Nuclear Physics.