# 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

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| Electrostatic        | SP5a     | Electricity and Magnetism | From *A Framework for K-12 Science Education:*  
*By the end of grade 12*  
**PS2B: Types of Interactions**  
- 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.  
- Magnets or changing electric fields cause magnetic fields.  
- Electric charges or changing magnetic fields cause electric fields.  
- Attraction and repulsion between electric charges at the atomic scale explain the structure, properties, and transformations of matter.  
**PS3A: Definitions of Energy**  
- At the microscopic scale, all of the different |  
| demonstrations     | SP5b     |                          |  
|                     | SP5c     |                          |  
|                     | SP5d     |                          |  
|                     | SP5e     |                          |  
|                     |          |                          |  

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.  
- Charged objects  
- Gravitational force  
- Electric force  
- Electric potential energy
manifestations of energy can be modeled as either motions of particles or energy stored in fields.

**PS3B: Conservation of Energy and Energy Transfer**
- Mathematical expressions, which quantify how the stored energy in a system depends on its configuration (e.g., relative positions of charged particles).

**PS3C: Relationship Between Energy and Forces**
- Force fields (gravitational, electric, and magnetic) contain energy and can transmit energy across space from one object to another.

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This instructional segment will connect to Modern and Nuclear Physics.