

Electricity and Magnetism



Purpose: As a result of this activity, students will be able to understand that electricity and magnetism are related forces.

Related Standard & Benchmarks:

Science Standard 10.

Understands forces and motion

Level III [Grade 6-8] Benchmark 2

Knows that just as electric currents can produce magnetic forces, magnets can cause electric currents

Student Product: Record of observations and conclusions

Material & Resources: Bar Magnet, Wire coil , 6V Lantern battery, magnetic compass, electrical measuring device (ammeter voltmeter or multimeter)

Teacher's Note: Students may work independently or in groups

Activity

Each student (or small group of students) should have available a bar magnet, a wire coil, a 6V Lantern battery, a magnetic compass, and an electrical measuring device (an ammeter, voltmeter, or multimeter). Each student should first examine the compass to note which direction the compass needle is pointing. Then he or she should move the bar magnet near the compass to see what effect it produces. Students should compare this reaction to the effect of the wire coil (not yet attached to the battery) when it is moved near the compass. Next, the student should attach the wire coil to the battery (one end to the positive terminal, the other to the negative) and observe the effect on the compass when it is moved around and through the wire coil. The student should then disconnect the wire coil from the battery and connect it to the meter (one end to each terminal). Holding the coil in an upright position, the student should move the bar magnet through the coil and observe what effect this has on the meter. Students report what happened and state the relationship they observed between magnetic force and electrical force. As an further extension of this activity, students can be asked to repeat the experiment with more or fewer loops in the wire coil or using wire of a different thickness. They then should report on what affect the changes had on their results.