

66. Electricity, Simple Circuits

Classroom Activity: Demonstrate a simple electrical circuit using a battery and flashlight bulb.

Grade(s): 6

Strand (s): Understanding Matter and Energy

This task addresses the following overall expectations:

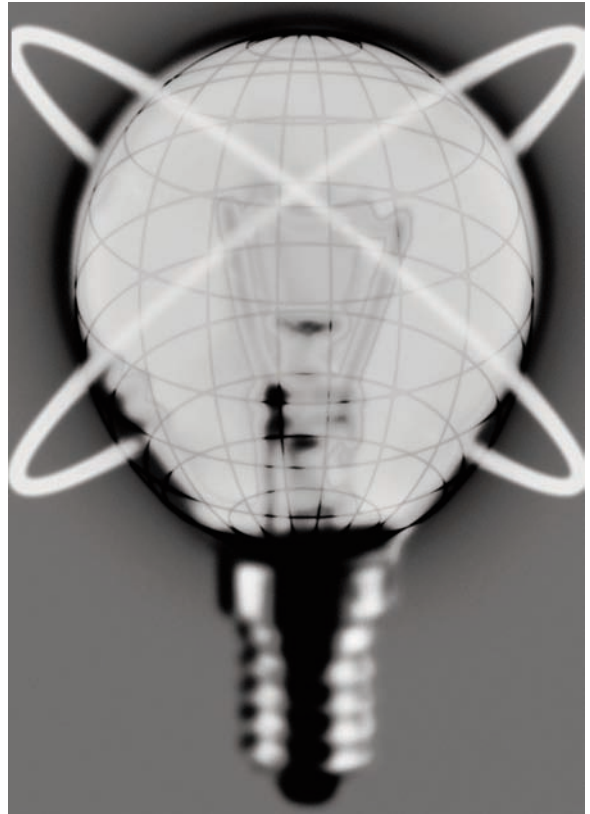
- investigate the characteristics of static and current electricity, and construct simple circuits;
- demonstrate an understanding of the principles of electrical energy and its transformation into and from other forms of energy.

and the following specific expectations:

- follow established safety procedures for working with electricity; design and build series and parallel circuits, draw labelled diagrams identifying the components used in each, and describe the role of each component in the circuit;
- use technological problem-solving skills to design, build, and test a device that transforms electrical energy into another form of energy in order to perform a function;
- use appropriate science and technology vocabulary, including current, battery, circuit, transform, static, electrostatic, and energy, in oral and written communication;
- use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes;
- identify ways in which electrical energy is transformed into other forms of energy;
- explain the functions of the components of a simple electrical circuit;
- describe series circuits (components connected in a daisy chain) and parallel circuits (components connected side by side like the rungs of a ladder), and identify where each is used.

Assessment Categories:

- Knowledge and Understanding
- Thinking and Investigation



- Communication

Type of Activity: Classroom

Time needed to plan: 2 hours

Time needed to complete activity: 1 hour

Materials/Resources for teachers:

- 8 inch electrical wire,
- 18 AWG or bigger
- 1 Flashlight bulb (1-3 volts)
- 1/2" by 11" piece of cardboard
- 6 brass paper fasteners
- 6 to 8 inch piece of wire stripped at both ends

Preparation:

- Cut a piece of wire 8 inches long for each flashlight.
- Strip about 1/2 inch of insulation from one end of the wire and twist strands together.

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- Strip 1 inch of insulation from the other end.
- Divide the stranded wire of the 1-inch end into 2 sections and twist the strands of wire in each section together. This will be used to hold the flashlight bulb.

Materials/Resources for students:

D Battery

Activity Description:

Have the students make their own flashlight using a D-cell battery and some wire and a bulb.

Step 1 - Using a piece of wire with the split end, have the students wrap the wire on either side of the flashlight bulb and then twist the 2 ends together. This helps to maintain good contact with the bulb. Wrap this in tape, but be careful to leave the bottom of the bulb exposed for circuit testing.

Step 2 - Tape the other end of the piece of wire to the bottom of the battery. Tape the wire to the flat or negative end of the battery. Bend the wire around to the side of the battery and wrap one piece of electrical tape around the battery.

Step 3 - Touch the bottom of the bulb to the positive end of the battery and see it light up.

Activity - Secret Circuits - push the paper fasteners

through the cardboard in any pattern you wish, or the students could make up their own pattern ahead of time. The only restriction is having the fasteners close enough together for the wire to reach. Each child in the group takes a turn connecting the wire between 2 fasteners. The card is then flipped over so they cannot see where the wires are connected. The other students take turns trying to find out which 2 pins have the wire using their new flashlight circuit testers.

Tips:

Recommend not purchasing the bulbs from a hardware store, as they are more expensive. You can buy several packages of cheap flashlights from a dollar store and hand out the flashlights to the students after.

Bring extra batteries in case students forget to bring one, or one is dead.