Simple Circuits

Lesson Concept A simple circuit is a single path by which electricity can travel.

Link In the previous lesson students learned that static electricity is the build up of electrical charge. In this lesson students learn that current electricity flows in a complete circuit. A complete circuit can be constructed in more than one way using the same materials.

Time 70 minutes

Materials

Whole class

1 D cell

1 Flashlight bulb

1 10-15 cm Insulated wire

1 Gallon plastic zip-top bag

Scissors to strip wire

Per Group (groups of 2)

1 D cell

1 1.5 Volt bulb

1 10-15 cm Insulated wire

1 Gallon plastic zip-top bag

Scissors

Glue

Individual

Science Notebooks

1 Activity Sheet

Advance Preparation

1. Strip 2 cm of insulation from both ends of the wire.
2. Place the following items in a plastic zip-top bag: 1 D cell battery, one10-15 cm wire with stripped ends, and 1 bulb.

Procedure:

Engage ***(15 minutes) A simple circuit provides a complete path for current electricity.***

1. Engage students in problem solving as you read the following scenario: Imagine that you are hiking with a friend in the mountains. You stumble and fall. Your flashlight falls out of your backpack. It rolls down the hill and out of sight. It is getting dark and you will need another light source. What should you do to create another light source?

Explore ***(15 minutes) A complete circuit is required for electricity to light the bulb.***

2. Display one set of materials in a plastic zip-top bag, i.e., 1 D cell battery, one 10-15 cm wire with stripped ends, and 1 bulb. Have students think-pair-share how they might use these materials to light the bulb. Chart student responses.
3. Distribute one set of materials in a plastic zip-top bag, i.e., 1 D cell battery, one 10-15 cm wire with stripped ends, and 1 bulb to each group of two students. Ask students to use the materials in their bag to light the bulb.
4. Once students have successfully lit the bulb, encourage them to try to light the bulb in a different way.

Explain ***(15 minutes) A complete circuit can be constructed in more than one way using the same materials.***

5. Distribute science notebooks. Have each student draw a diagram of how they assembled the materials to light the bulb. Have students label their diagrams with the following words: D cell battery, wire, and bulb.
6. Have students draw their complete circuits on the board. Ask students what they notice about the diagrams. [Expected Student Response (ESR): There are many ways to light the bulb.]
7. Ask, “What do all of the complete circuits have in common?” Have students generalize a rule for lighting the bulb. (ESR: Metal must be touching metal. The base of the light bulb must touch the metal cap of the battery and the wire.)

Extend ***(15 minutes) A complete circuit can be constructed in more than one way using the same materials.***

8. Distribute the **Activity Sheet**. Have students predict which of the circuits will light the bulb. Have students draw a circle around the circuits they think will light the bulb.
9. Have students use their materials to test one of the circuits they have circled.
10. Have students select one of the incomplete circuits. Ask students to explain why that circuit will not light the bulb. (ESR: Metal is not touching metal. The base of the light bulb does not touch the metal cap of the battery and the wire.)
11. Have students cut-out and glue the **Activity Sheet** into their science notebooks.

Evaluate ***(10 minutes) A complete circuit is required for electricity to light the bulb.***

12. Distribute science notebooks. Have students record the following question in their science notebooks: What must you do to light the bulb? (ESR: Metal must be touching metal. The base of the light bulb must touch the metal cap of the battery and the wire.

Name_____

Activity Sheet