

Positively ELECTRIC

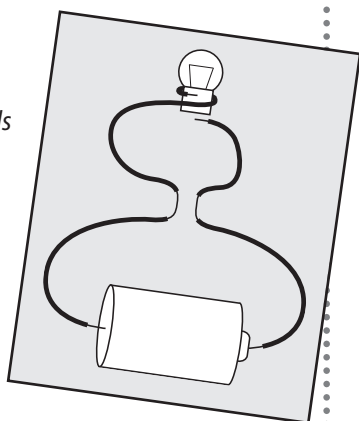
In his new **UL/Disney Educational Productions DVD, *Safety Smart Science with Bill Nye the Science Guy: Electricity***, Bill demonstrates how an electrical circuit can be interrupted by a fault—even if that fault is a young student! Try it...and positively electrify your classroom.

MATERIALS:

- Two 10-inch lengths of insulated wire, (with outer insulation removed at ends and in a two-inch middle section)
- A "D" cell battery
- A flashlight bulb
- Cardboard
- Masking tape

PROCEDURE:

- The goal of the classroom experiment is to demonstrate what causes a "short circuit." Students will demonstrate how to "break" an electrical circuit—but they won't be in trouble.
- Before the experiment, use wire strippers or a file to take the insulation off of both ends of each 10-inch wire. Also strip away the insulation from the middle of each so you have about 2 inches of exposed wire.
- Select 2 or 3 "safety scientists" in your class to perform the experiment. Then, have the students bend each wire in the middle to make a kind of "bump" in it.
- Attach the wires to the top and bottom of the battery, then tape the wires down side by side so the exposed wire lines up.
- Use a piece of cardboard to make a stand for the bulb. Wrap one end of one wire around the base of the bulb. Then, touch the end of the other wire to the bottom of the bulb and tape in place.
- With the circuit complete, the bulb should light up.
- Instruct students to watch what happens when they touch a conductor, like a piece of wire, to the exposed parts of the other two wires. The bulb should go out—because it's short-circuiting.



CONCLUSIONS:

- The experiment results illustrate that electricity always takes the shortest path to complete a circuit. So in this case, the electricity flows from the battery, through the wire and then jumps from one exposed wire to the other to complete the circuit. Since it completely cuts the bulb out of the loop, it's a "short" circuit.
- This short circuit isn't dangerous because there is so little electricity flowing through the wires. But if you hold this wire in place long enough, it does start to get warm.
- Remind students that when a short circuit happens with household wiring, it can heat up and start a fire, or shock you. That's why controlling the flow of electricity is Safety Smart®.
- After the experiment (or before), view the DVD, *Safety Smart Science with Bill Nye the Science Guy: Electricity* and compare your results.

