

Teacher Demonstration: Short Circuit!

Understand the way in which electricity seeks the shortest route to complete a circuit, and the result

MATERIALS:

- Electrical wire (two strands worn at the midpoint)
- Battery
- Small light bulb
- Tape
- Rubber kitchen gloves
- Eye goggles
- Shallow pan (shoe box lid with a liner will work)
- Sport drink with electrolytes (or salt water)



PROCEDURE:

1. Arrange the circuit as in the **Student Activity Sheet: Making a Simple Circuit** (p. 14-15). Most of the arrangements used the previous day will work. You may wish to use one of the arrangements invented by one of your student groups. The only difference in this demonstration arrangement is that the insulation has been removed from the wires near the midpoint. As in the demonstration in Chapter 13, tape the wires down so that the exposed wires near the midpoint are immobile and not touching. But for this demonstration, make the surface to which they are taped a small, shallow pan.

Note: Be sure to wear goggles and gloves. A smaller battery is recommended (e.g., D cell, etc.), as there may be a small amount of smoke or odor. The demonstration is perfectly safe, but do not allow students to be too close. Remember, you're a role model!

2. Gather the students close enough so that they can actually see the circuit and the lit bulb. If you have a very large class, consider a camera and screen to make the demonstration easily viewed throughout the classroom. You may also wish to dim the lights in the room for added effect.
3. Tell the students that we are now going to perform the short circuit demonstration ourselves. Ask them if anyone has a good conductor on them that will work for connecting the wires. As they hesitate, take out the sport drink, ask if anyone has ever spilled one of these, and pour it into the shallow pan. You may instead use salt water and ask what would happen if the wires were exposed in a pool of water.
4. Conclude the demonstration by briefly discussing the fact that there are numerous reasons and conditions that make a short circuit a safety hazard, and one that should be immediately repaired by a qualified professional.
5. Start to clean up, make a show of remembering to use your gloves before disconnecting the wires, removing them from the pan, and cleaning off the rest of the work surface. Don't miss the opportunity to model being **Safety Smart®!**