Build a Simple Circuit with a Battery and Bulb



Grade: 5th Grade | **Topic:** Simple Circuit with a Battery and Bulb | **Measurement:** US Customary (cups, ounces, inches, etc.)

Purpose

This experiment will teach you how to make a simple electrical circuit that lights up a bulb. You will learn how electricity flows from a battery through wires to power a bulb.

Hypothesis

If the wires connect the battery to the bulb in a complete loop, then the bulb will light up because electricity can flow through the circuit.

Materials

- 1 small flashlight bulb (3 volts)
- 1 AA battery (1.5 volts) or two AA batteries with a battery holder
- 2 insulated copper wires, about 6 inches each (with stripped ends)
- 1 small piece of aluminum foil (about 2 x 2 inches)
- Electrical tape or clear tape
- Scissors (for adult use to strip wires if needed)

Procedure

- 1. 1. Carefully strip about 1/2 inch of insulation off both ends of each copper wire, or use wires that are already stripped.
- 2. 2. Attach one end of the first wire to the positive (+) end of the battery by taping it securely.
- 3. 3. Attach the other end of that wire to the metal base of the bulb (the metal tip at the bottom). Use tape to hold it in place.
- 4. 4. Attach one end of the second wire to the metal side of the bulb (the threaded metal part). Tape it securely.
- 5. 5. Attach the other end of the second wire to the negative (-) end of the battery. Tape it in place.
- 6. 6. Check your circuit. If all connections are tight and correct, the bulb should light up.
- 7. 7. To test what happens when the circuit is broken, gently disconnect one wire and observe if the bulb goes off.
- 8. 8. Use the small piece of aluminum foil as a switch: place it between the wire and bulb's metal side and remove it to open and close the circuit.

Results

When the wires are connected in a complete loop from the battery to the bulb, the bulb lights up. If the circuit is broken by disconnecting a wire or removing the foil switch, the bulb turns off.

Conclusion

Electricity flows through a complete circuit to power the bulb. A break or gap in the circuit stops the flow of electricity and the bulb will not light.

Learning Objectives

- Understand basic components of an electrical circuit.
- Learn how electricity flows in a closed circuit.
- Develop skills in connecting a battery, wires, and bulb safely.
- Observe what happens when the circuit is complete versus broken.

Teacher Notes:

Key Concept: A simple electrical circuit requires a power source, a load (like a bulb), and conductive paths (wires) creating a closed loop. Electricity flows through this loop to power the bulb.

Answer/Explanation: The bulb lights because electrical current travels from the battery's positive end, through the wire, into the bulb's filament, then back through the second wire to the battery's negative end. Breaking the circuit stops this flow, turning off the bulb.

Teaching Tips:

• Emphasize safety by reminding students not to touch exposed wires when connected. 2. Use clear tape to secure wires and avoid loose connections. 3. Explain the difference between open and closed circuits clearly. 4. Encourage students to try making a switch using foil as a hands-on tool for circuit control.

Relevant Standards: NGSS 4-PS3-2: Make observations to provide evidence that energy can be transferred from place to place by electric currents., NGSS 4-PS3-4: Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

Name:	Science
Date:	Coperiments
Experiment Title:	
Purpose: (I wonder)	
Hypothesis: (I think)	
Materials:	
Procedure:	
Results: (What happened?)	
Conclusion: (I learned)	