

Photo Description



A person is using a small light bulb and wires to test if a battery works. The light bulb is glowing, which shows electricity is moving through the wires from the battery to make light.

Scientific Phenomena

This image demonstrates an electrical circuit as the anchoring phenomenon. The battery provides electrical energy that flows through the conducting wires to power the light bulb, creating a complete pathway for electricity to travel. When the circuit is complete (closed), electrons flow from the negative terminal of the battery, through the wires and bulb, and back to the positive terminal, causing the bulb to illuminate.

Core Science Concepts

1. Electrical Circuits: Electricity needs a complete path to flow from one end of a battery to the other
2. Energy Transfer: Batteries store energy that can be changed into light energy
3. Conductors: Some materials like metal wires let electricity flow through them easily
4. Cause and Effect: When we connect a battery to a light bulb the right way, the bulb lights up

Pedagogical Tip:

Start with familiar examples like flashlights and toys that use batteries. Let students predict what will happen before demonstrating, then compare their predictions to observations.

UDL Suggestions:

Provide multiple ways to engage: hands-on circuit building, drawing circuit diagrams, and acting out being "electricity" moving through a human chain circuit around the classroom.

Zoom In / Zoom Out

1. Zoom In: Inside the wires, tiny particles called electrons are moving very fast from the battery through the wire to the light bulb, carrying energy that makes the bulb glow.
2. Zoom Out: This simple circuit connects to larger electrical systems - the same principles work in our homes where electricity travels through wires in the walls to power lights, computers, and appliances throughout the building.

Discussion Questions

1. What do you think would happen if we took one wire away from the battery? (Bloom's: Predict | DOK: 2)
2. Why do you think the light bulb is glowing? (Bloom's: Analyze | DOK: 2)
3. What other things in your house need batteries to work? (Bloom's: Apply | DOK: 1)
4. How could we make this light bulb brighter or dimmer? (Bloom's: Create | DOK: 3)

Potential Student Misconceptions

1. Misconception: "Electricity gets used up in the light bulb"
Clarification: Electricity flows in a circle back to the battery; the energy changes from electrical to light energy
2. Misconception: "Both wires need to touch the same part of the battery"
Clarification: One wire connects to each end (positive and negative) of the battery to make electricity flow
3. Misconception: "Bigger batteries always make brighter lights"
Clarification: The voltage (strength) of the battery matters more than its physical size

NGSS Connections

Performance Expectation: 1-PS4-3. Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.

Disciplinary Core Ideas: 1-PS4.C

Crosscutting Concepts: Cause and Effect

Science Vocabulary

- * Battery: A container that stores energy to make electricity
- * Circuit: A path that electricity follows in a complete circle
- * Electricity: Energy that can flow through wires to power things
- * Conductor: Something that lets electricity flow through it easily
- * Energy: The power to make things work or change

External Resources

Children's Books:

- Switch On, Switch Off by Melvin Berger
- The Magic School Bus and the Electric Field Trip by Joanna Cole
- Oscar and the Bird: A Book About Electricity by Geoff Waring

YouTube Videos:

- "Electricity for Kids | What is Electricity? Where does Electricity come from?" - Simple explanation of electricity basics for young learners (<https://www.youtube.com/watch?v=mc979OhitAg>)
- "Simple Circuits for Kids" - Demonstrates basic circuit building with batteries and bulbs (https://www.youtube.com/watch?v=J4Vq_ZHlvpU)