

Photo Description



This image shows wires of different colors connected to a green circuit board with numbered slots. The wires carry electricity through the board to make things work. You can see there is also a yellow box on the right side that helps control the electricity flow, like a light switch does.

Scientific Phenomena

Anchoring Phenomenon: How does electricity travel through wires to make things light up or move?

This image represents a simple electrical circuit—a complete path that electricity travels along. Electricity flows from a power source (like a battery) through wires and into devices that use that energy to do work (like lighting a bulb or making a motor spin). When the circuit is complete (all connected), electricity can flow. When it is broken (disconnected), electricity stops flowing and the device stops working. This happens because electrons move through the metal wires in a continuous loop when there is a complete path.

Core Science Concepts

1. Electricity needs a complete path to flow: Electricity is like water in a pipe—it needs a continuous route to travel through. If the path is broken anywhere, the electricity stops moving.
2. Circuits can be open or closed: A closed circuit is complete and allows electricity to flow (the light is on). An open circuit has a break in the path and stops electricity from flowing (the light is off).
3. Wires are conductors: Metal wires allow electricity to pass through them easily. Different colored wires help us organize and identify different parts of a circuit.
4. Energy transfer and transformation: Electricity is a form of energy that travels through wires and is transformed into other forms of energy like light, heat, or motion.

Pedagogical Tip:

For First Graders, use the analogy of a "circle game" where students hold hands in a circle—electricity flows around smoothly. When someone lets go (breaks the circuit), the flow stops. This concrete, kinesthetic understanding helps young learners grasp the abstract concept of circuits without overwhelming them with technical details.

UDL Suggestions:

Multiple Means of Representation: Provide physical manipulatives (pipe cleaners, batteries, bulbs) so students can build their own circuits while discussing the concept. Some students learn better through hands-on exploration than through images alone. Multiple Means of Engagement: Allow students to predict what will happen ("Do you think the light will turn on?") before testing circuits, building curiosity and ownership of their learning.

Discussion Questions

1. What do you think happens when we unplug one of the wires from the circuit board? (Bloom's: Predict | DOK: 1)
2. Why do you think we need wires to connect all these parts together? (Bloom's: Understand | DOK: 2)
3. If the light doesn't turn on, what could be wrong with our circuit? (Bloom's: Analyze | DOK: 2)
4. Can you think of other things in your house that use circuits and electricity to work? (Bloom's: Apply | DOK: 2)

Extension Activities

1. Build Your Own Simple Circuit: Provide students with AA batteries, battery holders, LED bulbs, and pre-stripped wires in a kit format. Allow them to connect the wires and watch the light turn on and off by making and breaking the circuit. Have them draw pictures of what they built and color the wires to match the real colors used.
2. Circuit Hunt Around the Classroom: Take students on a "circuit walk" around the school or classroom to identify things that use electricity (lights, smartboard, fan, pencil sharpener). Discuss how circuits are inside these devices making them work. Create a picture chart showing all the things they found.
3. Open and Closed Circuit Game: Create large laminated cards showing open and closed circuits with simple diagrams. Students sort cards into two piles while a partner checks their work. Then, switch roles. This reinforces the vocabulary in a playful, kinesthetic way.

NGSS Connections

Performance Expectation:

1-PS4-1: Plan and conduct investigations to provide evidence that vibrations make sound and that various materials can be used to block sound.

Disciplinary Core Ideas:

- 1-PS4.A (Sound is produced by vibrating materials; sound can make materials vibrate)
- 1-ETS1.A (Problems can be solved by applying ideas from prior knowledge of nature)

Crosscutting Concepts:

- Energy and Matter (Energy can be transferred in different ways)
- Systems and System Models (A circuit is a system with connected parts)

Note: While First Grade NGSS standards emphasize sound and vibrations, simple circuit exploration supports foundational understanding for future grades (K-2-ETS1, 2-PS1, 3-PS2) and aligns with inquiry practices and engineering design thinking.

Science Vocabulary

- * Circuit: A closed path that electricity travels along to make something work.
- * Electricity: A form of energy that flows through wires and powers things like lights and toys.
- * Conductor: A material (like metal) that lets electricity pass through it easily.
- * Open circuit: A broken or incomplete path that stops electricity from flowing.
- * Closed circuit: A complete path where electricity can flow all the way around.

* Wire: A thin metal conductor that carries electricity from one place to another.

External Resources

Children's Books:

- Electricity by Sian Smith (DK Findout Series) – Clear, colorful photos and simple explanations ideal for First Grade
- Lights All Around Us by Mary Hill (National Geographic Little Kids) – Explores electricity and light in relatable, everyday contexts
- The Plug and Play Book by Kate Burns – Interactive lift-the-flap book about how electricity works in simple terms

YouTube Videos:

- "Simple Circuits for Kids" (Khan Academy Kids) – 3-4 minute animated explanation with real-world examples. <https://www.youtube.com/watch?v=3fT0aWMJ72U>
- "How Do Circuits Work? (Electricity Basics)" (SciShow Kids) – Engaging host explains open/closed circuits with fun visuals. <https://www.youtube.com/watch?v=b8Zxwcaqj0M>

Teacher Tip: Start with exploration before formal vocabulary. Let students play with circuits first, then name what they observe. This builds genuine understanding and curiosity!