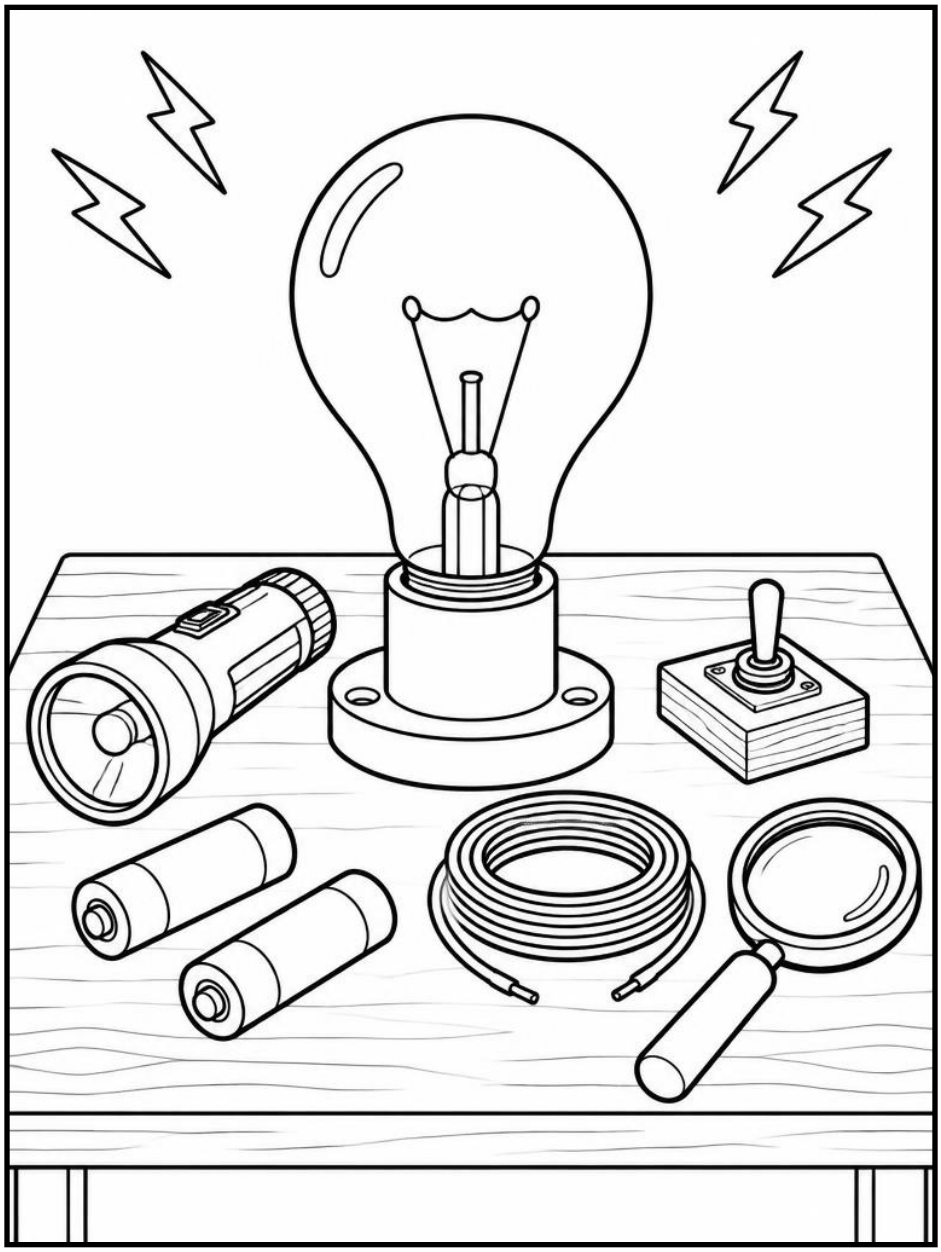
Electricity & Circuits

Learning Pack · Color It. Learn It. Explore It.

Ages 6–10 · Grades 1–4 (approximate) · Physical Science / Electricity · 30–75 minutes

Name: _____



Inside: facts · vocabulary · label a circuit · open or closed · conductors · quiz · answer key · notes

What you will learn

Learning objectives

- ☐ Explain what a simple electrical circuit is.
- ☐ Name the main parts of a circuit.
- ☐ Tell the difference between open and closed circuits.
- ☐ Sort common materials into conductors and insulators.
- ☐ Describe basic electrical safety rules.

Five electricity facts

Fact 1: What is electricity?

Electricity is about electric charge. In a battery circuit, electric current is the movement of electric charge along a path that conducts, like a metal wire.

Fact 2: A circuit needs a complete path

Current flows steadily only when the path is complete — a closed circuit. If the path is broken, for example by opening a switch, the current stops and the bulb goes out.

Fact 3: Batteries provide energy

A battery uses chemical reactions inside it to supply energy. That energy pushes electric charge around the circuit. When the chemicals are used up, the battery can no longer do this well.

Fact 4: Conductors and insulators

Conductors let electric charge move easily — many metals, like copper, are good conductors. Insulators, like dry plastic and rubber, resist it. No material is perfect at either.

Fact 5: Electrical safety

Never put objects into outlets, touch damaged cords or play with household wiring. Household mains electricity can cause serious injury. Never experiment with electrical outlets. Classroom circuits use small, low-voltage batteries with an adult.

Sources (checked October 2026)

Facts 1, 2, 4, 5: TeachEngineering (University of Colorado Boulder), teachengineering.org/lessons/view/cub_electricity_lesson03
Fact 3: U.S. Department of Energy, DOE Explains... Batteries, energy.gov/science/doe-explainsbatteries

Electricity words

Electricity	Energy and effects caused by electric charge, which can be still or moving.
Circuit	A connected path that electric current can flow around.
Battery	A device that supplies electrical energy using chemical reactions inside it.
Current	The movement of electric charge through a conductor.
Conductor	A material that lets electric charge move easily, like copper.
Insulator	A material that resists the movement of electric charge, like dry plastic.
Switch	A part that opens or closes a gap in the circuit to turn it off or on.
Open circuit	A circuit with a break in its path. Current cannot flow.
Closed circuit	A circuit with a complete path. Current can flow.

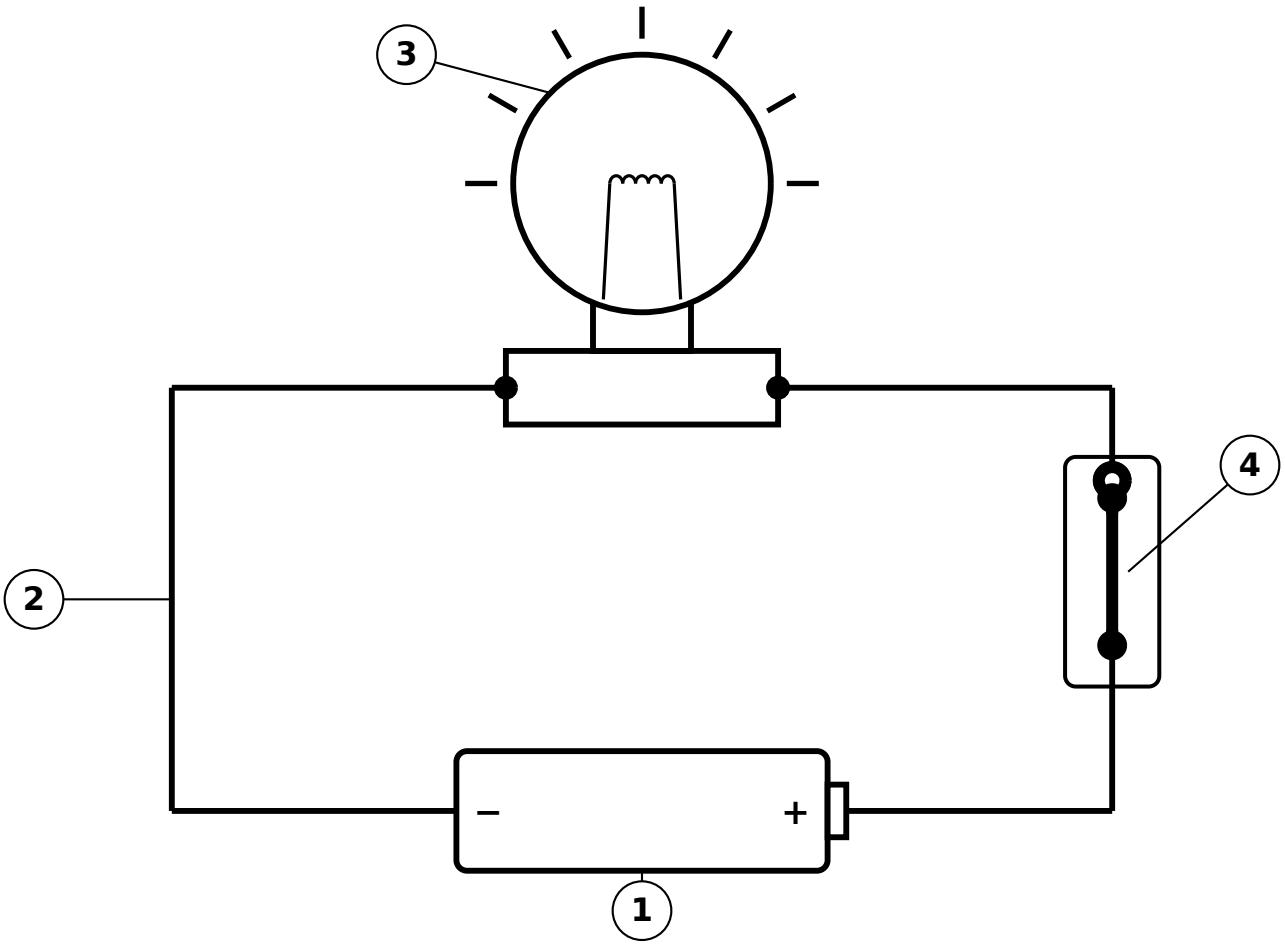
Your turn: write a sentence using two vocabulary words.

Label a simple circuit

Name: _____ Date: _____

This circuit is closed, so the bulb is lit. Write the name of each numbered part. Use each word once.

Battery · Wires · Light bulb · Switch



1. _____ 2. _____

3. _____ 4. _____

What happens if the switch opens?

_____

_____

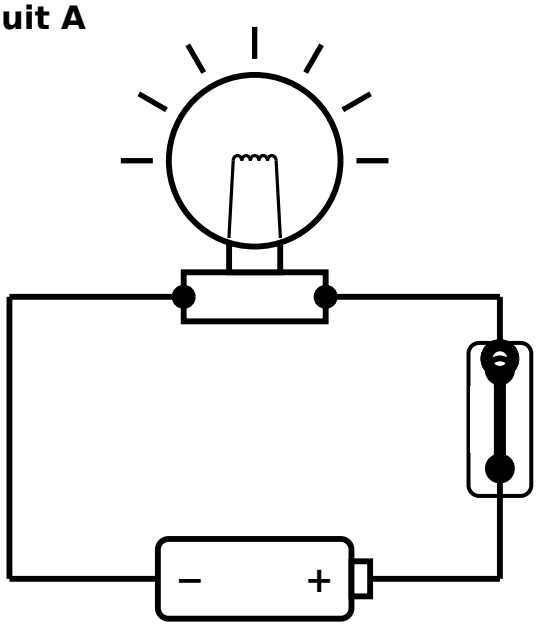
Electricity science activities

Name: _____ Date: _____

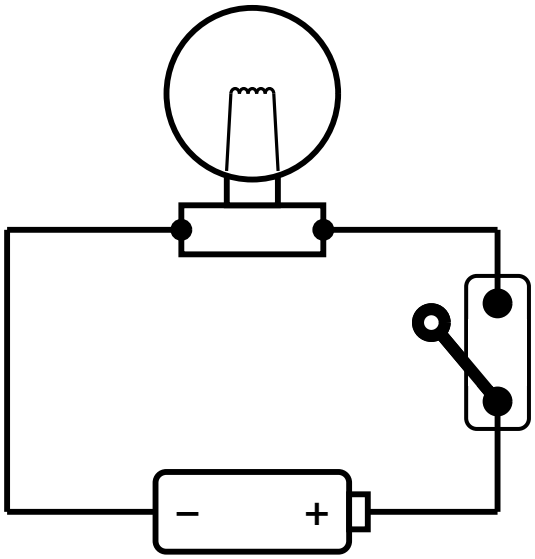
Activity A: Open or closed circuit?

The two circuits use the same parts. Only the switch is different.

Circuit A



Circuit B



1. Which circuit is closed? _____
2. Which bulb will light? _____
3. Why will the other bulb stay off?

Activity B: Conductor or insulator?

Think about ordinary, dry objects in a classroom. Write each object in the right column. Never test objects in a wall outlet.

Copper wire · Plastic ruler · Metal spoon · Rubber eraser

Conductor	Insulator

Extension: why do electrical wires have metal inside and plastic outside?

Electricity quiz

Name: _____ Date: _____

Fill in the circle next to the best answer.

1. What makes a complete circuit?

- ◯ a) A path with a break in it
- ◯ b) A connected path from one battery terminal, through the parts, back to the other
- ◯ c) A battery sitting next to a bulb

2. What does a battery do in a circuit?

- ◯ a) It supplies the energy that moves electric charge
- ◯ b) It makes an endless supply of electrons
- ◯ c) It stops current from flowing

3. What happens when a switch opens?

- ◯ a) The bulb gets brighter
- ◯ b) The path is broken, so current stops and the bulb goes out
- ◯ c) The battery becomes a conductor

4. Which material is a good conductor?

- ◯ a) Copper
- ◯ b) Dry rubber
- ◯ c) Plastic

5. Which electrical safety rule is correct?

- ◯ a) It is fine to poke things into outlets
- ◯ b) Never put objects into electrical outlets
- ◯ c) Damaged cords are safe to use

Bonus: Why do you think a flashlight stops working when its batteries are used up?

Answer key

Label a simple circuit (page 4)

1. Battery 2. Wires 3. Light bulb 4. Switch

If the switch opens: the conducting path is broken, so current stops and the bulb goes out.

Activity A: Open or closed circuit?

1. Circuit A is closed. 2. The bulb in Circuit A lights. 3. Circuit B's switch is open, so there is a gap in the path and no current can flow.

Activity B: Conductor or insulator?

Conductors: copper wire, metal spoon. Insulators: plastic ruler, rubber eraser.

Extension: the metal conducts electricity; the plastic insulates it so people don't touch the metal by accident.

Quiz

1. b) A connected path from one battery terminal, through the parts, back to the other
2. a) It supplies the energy that moves electric charge
3. b) The path is broken, so current stops and the bulb goes out
4. a) Copper
5. b) Never put objects into electrical outlets

Bonus (answers will vary): as a battery is used, its chemical reactions can no longer keep up enough push (voltage) to run the flashlight properly, so the bulb dims or goes out.

Teacher and parent notes

Who it is for

Ages 6–10 (about grades 1–4). Time: 30–75 minutes, depending on the activities selected.

Suggested order

1) Facts. 2) Vocabulary. 3) Label the circuit. 4) Open vs closed. 5) Conductors and insulators. 6) Quiz. 7) Color the cover or a sheet from the free Science Lab collection.

Hands-on: light a bulb

Use a store-bought low-voltage kit: a battery holder with matching batteries, a matching miniature bulb or LED module, insulated leads and a switch. An adult checks the parts match. Build the circuit, close the switch, watch the light, open the switch, and talk about why it changed. A bare LED needs a resistor — use a kit module instead.

Safety

Adult supervision. Never use wall outlets, open appliances or cut cords. Never use damaged batteries, and never connect a wire straight across a battery. Stop if anything gets hot. No loose button or coin cells; keep batteries away from very young children and store them safely. Follow the kit's instructions.

Paper-only circuit investigation

1) Look at Circuit A on page 5. 2) Trace the complete path from one battery terminal, through the bulb and closed switch, back to the other terminal. 3) On Circuit B, circle the gap at the open switch. 4) Draw a third circuit with an open switch. 5) Explain why its bulb stays off.

Discussion questions

Why does a circuit need a complete path? What does a switch do? Why do wires have metal inside? Why is electrical safety important?

A note on the science

Current is moving electric charge. The battery supplies energy through chemical reactions; it does not run out of electrons. A switch opens or closes the path.