

Electricity

Circuits, conductors & components



1. What is needed to make a simple electrical circuit work?

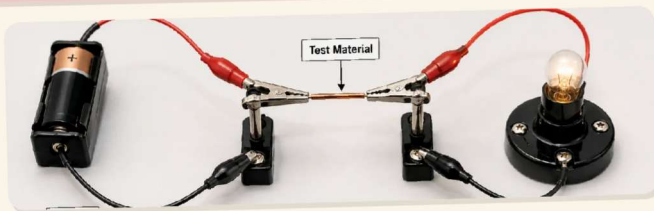
A **circuit** needs a complete loop: power source, wires and a component like a bulb.

- If the loop is broken anywhere, the circuit stops working.
- Electricity flows from the battery, through the components, and back again.

3. Which materials conduct electricity, and which are insulators?

A **conductor** (like metal) lets electricity flow through it; an **insulator** (like plastic) does not.

- We can test materials by placing them in a circuit and seeing if the bulb lights.
- Wires are covered in plastic insulation to keep us safe from the metal conductor inside.



5. What does a switch do in a circuit?

A **switch** opens or closes a circuit, turning the flow of electricity on or off.

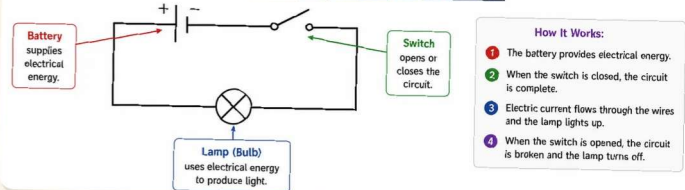
- An open switch breaks the loop, so the bulb goes off.
- A closed switch completes the loop, so the bulb lights up.

6. Greater Depth: why do more bulbs in a series circuit shine dimmer?

The same electrical energy is shared between more bulbs, so each gets less.

- This is why fairy lights sometimes get dimmer with more bulbs added.
- Comparing brightness with 1, 2 and 3 bulbs shows this pattern clearly.

SIMPLE CIRCUIT DIAGRAM



2. What are circuit symbols, and how do we draw a circuit diagram?

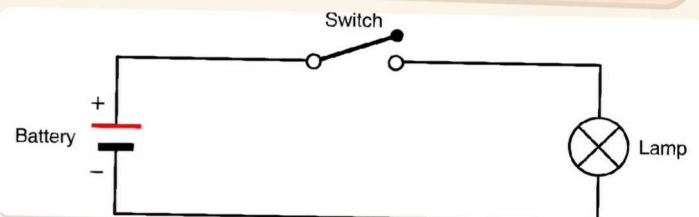
Scientists use standard **symbols** to draw circuits quickly and clearly.

- A circle with a cross is a bulb; two parallel lines are a battery.
- A switch symbol shows a break in the circuit that can open or close.

4. How does the length of wire in a circuit change bulb brightness?

A **longer wire** has more resistance, which usually makes a bulb **dimmer**.

- More resistance means less electricity can flow around the circuit.
- Adding more bulbs in the same simple circuit usually makes each one dimmer too.



CIRCUIT SYMBOLS

Cell	Battery	Resistor	Variable Resistor	Lamp (Bulb)	Switch (Open)	Switch (Closed)	Ammeter	Voltmeter	Motor	Buzzer	Diode	LED
Single cell provides electrical energy.	Two or more cells connected together.	Resists the flow of electric current.	Allows resistance to be changed.	Produces light when current flows.	Breaks the circuit; stops the current flow.	Completes the circuit; allows current flow.	Measures current in amperes (A).	Measures potential difference in volts (V).	Converts electrical energy into motion.	Produces sound when current flows.	Allows current to flow in one direction.	Emits light when current flows.

7. TAPS: How do we write up our conductors test?

FAIR TEST

Our TAPS test: **which materials conduct electricity?** We build our own circuit with a test gap, then swap in different materials to see which ones complete the circuit and light the bulb.

- Question → **prediction** → variables (independent / control / dependent).
- Materials → **method** → carry out the test → **results** → **conclusion**.

Which Materials Conduct Electricity? – Results Table

We tested different materials in a circuit and observed the brightness of the bulb.

Material Tested	Bulb Brightness	Result	Conducts Electricity?
Copper (coin)	Very bright	Bulb lit very brightly.	Yes – good conductor
Aluminium foil	Bright	Bulb lit brightly.	Yes – good conductor

KEY VOCABULARY

circuit cell / battery conductor insulator switch component symbol brightness
independent variable predict conclusion

SKILLS I'LL USE

- Build a working circuit
- Draw circuit diagrams with symbols
- Plan & carry out a fair test
- Record results in a table
- GD: explain brightness using ideas about shared electricity