



Electricity and Circuits! Year 6 Science at Home

You can help! You do not need to know all the answers. The best way to help is to ask questions and listen to your child explain their thinking. Just 10 minutes of talking each week makes a big difference!

Why are we learning this? Electricity and energy in remote communities

Electricity is essential to life in remote communities — and often more visible here than in cities. Solar panels convert light energy to electrical energy. Diesel generators provide backup power. Community fridges keep medicines and food safe. Electrical faults in remote areas are serious because help is far away. Understanding how circuits work — what connects, what can break a circuit, what a switch does — helps your family be safer at home and helps your child understand the technology that powers your community every day.

My child will learn to:

✓ Name circuit parts

Name the key parts of a simple circuit: power source (battery), wire, switch and device (globe, buzzer or fan).

✓ Explain what each part does

Describe what each component does and why the circuit must form a complete (closed) loop to work.

✓ Energy changes

Explain how electrical energy is converted into light, heat, sound or movement by different devices.

✓ Conductors and insulators

Identify materials that allow electricity to flow (conductors) and those that block it (insulators).

Big ideas to know:

How a circuit works

A circuit is a complete loop that electricity travels around. You need: a power source (battery) to push the electricity, wires to carry it, and a device (globe, buzzer, fan) to use the energy. If the loop is broken anywhere — even a tiny gap — electricity cannot flow and the device stops working. This is exactly how a switch works: it creates or closes the gap in the circuit!

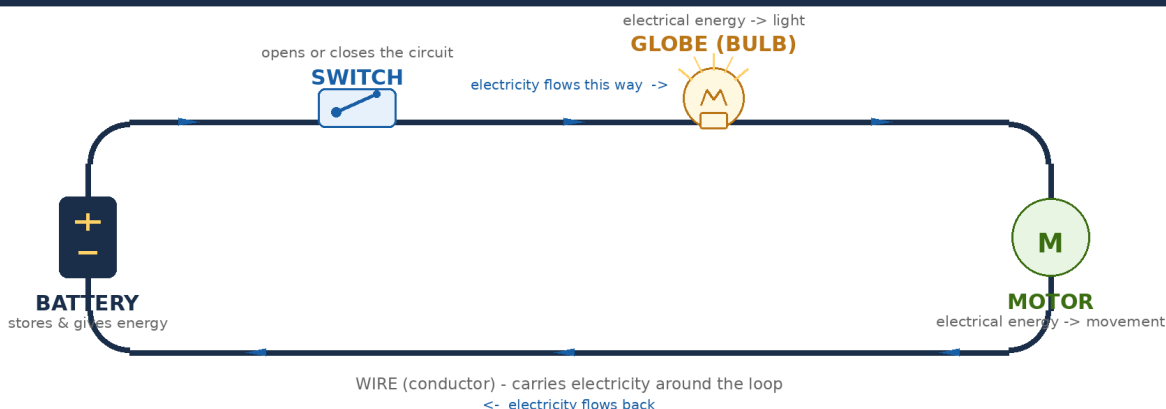
Energy changes

Electrical energy does not disappear — it is converted into another form. A light globe converts electrical energy into light and heat. A buzzer converts it into sound. A fan converts it into movement (kinetic energy). A phone charger converts it into chemical energy stored in the battery. Scientists call this energy transformation — it happens every time you use an electrical device.

Conductors and insulators

Some materials allow electricity to flow through them easily — these are conductors. Most metals are good conductors: copper wire, aluminium foil, iron nails. Other materials block electricity — these are insulators. Plastic, rubber, wood and glass are insulators. This is why wires have a plastic coating — the copper inside conducts electricity safely, and the plastic outside protects you from a shock!

How a simple circuit works





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Circuit components and energy changes

Component	What it does	Energy change
Battery (power source)	Stores chemical energy and pushes electrical energy around the circuit	Chemical energy → electrical energy
Wire	Carries electrical energy from one component to the next — must form a complete loop	No energy change — just carries it (metal = conductor)
Switch	Opens or closes the circuit to control whether electricity can flow	No energy change — just controls the flow of current
Light globe (bulb)	Converts electrical energy into useful light — also produces heat	Electrical energy → light energy + heat
Buzzer	Converts electrical energy into sound using vibration of a small membrane	Electrical energy → sound energy (+ a little heat)
Fan (motor)	Converts electrical energy into spinning movement	Electrical energy → kinetic (movement) energy

Think Like a Scientist — Electricity Detective

Walk around your home and find 3 things that use electricity. For each one, ask: what does it do? Where does the electricity come from? Does it make light, sound, heat or movement?

Ask: "Does the circuit have to be complete to work? What would happen if you unplugged one wire? That's the gap in the circuit — like a switch turned off!" This is the most important concept in this topic.

You will need: (Materials)

- Paper and pencil (to draw circuit diagrams)
- Torch with removable batteries (to see the real circuit)
- Household objects to test as conductors or insulators (coins, keys, plastic, rubber)
- Phone or tablet (for free circuit simulation apps — optional)

Appliances to investigate:

1. Torch: battery → wire → switch → globe → light + heat
2. Fan: power source → wire → motor → movement (kinetic energy)
3. Phone charger: electrical → chemical energy stored in battery
4. Radio: electrical → sound energy (speaker vibrates the air)
5. Fridge: electrical → kinetic (compressor) → heat pumped out → cold inside

Questions to ask your child

1. What does a battery do in a circuit?
2. Why does a circuit need to be complete (a closed loop) to work?
3. What does a switch do?
4. What is the difference between a conductor and an insulator?

5. What happens to electrical energy in a light bulb?
6. Which things in our house are conductors? Which are insulators?
7. What energy change happens in our solar panels, and then in our lights?

Take a torch apart together (make sure it is OFF first!). You can see the circuit — battery connects to a wire that connects to the globe and back. When you press the switch, it closes the gap and completes the circuit. When the globe lights up, your child has seen a complete circuit in action!

Key words to know:

Circuit	A complete loop that electricity travels around — must have no gaps to work
Battery	Stores chemical energy and pushes electrical energy around the circuit
Conductor	A material that allows electricity to flow through it easily — e.g. most metals
Insulator	A material that blocks electricity — e.g. plastic, rubber, wood, glass
Switch	A component that opens or closes the circuit to turn electricity on or off
Energy transformation	When electrical energy is converted to another form — light, heat, sound or movement
Circuit diagram	A simplified drawing using symbols to show how the components of a circuit are connected

Key words to look up

Circuit · Battery · Conductor · Insulator · Switch · Energy transformation · Circuit diagram

What school will check

By the end of Year 6, your child needs to describe the role of each component in a circuit, explain why the circuit must be complete, identify conductors and insulators, and describe how electrical energy is transformed.

Try it at home!

Test household objects as conductors or insulators using a simple circuit: touch each object to two wires connected to a battery and globe. If the globe lights up, the object is a conductor. If not, it is an insulator. Which objects surprise you?