Year 4 Science Knowledge Organiser – Electricity

Working scientifically, we will:

- Record findings using more complex scientific language, drawings, labelled diagrams, keys, bar charts and tables.
- Report on findings from enquiries.

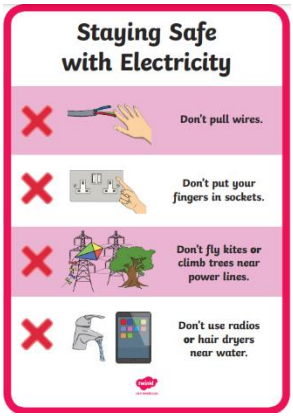
Electricity is generated using energy from natural sources such as the sun, oil, water and wind. These can also be called fuel sources.

Key Vocabulary

Appliances / devices (electrical)	A device or machine in your home that you use to do a job such as cleaning or cooking. Appliances are often electrical.	Insulator	A non-conductor of electricity of heat.
Battery	A battery is a collection of cells that converts chemical energy into electrical energy.	Mains	Where the supply of water, electricity, or gas enters a building.
Cell	A cell is a single unit of device that converts chemical energy into electrical energy.	Current	A flow of electricity through a wire or circuit.
Complete Circuit	A complete route which an electric current can flow around.	Component	A part of a larger whole e.g. a bulb in a circuit.
Conductor	A substance that heat or electricity can pass through or along.	Power	Power is energy, especially electricity, that is obtained in large quantities from a fuel source and used to operate lights, heating, and machinery.
Electricity	A form of energy created from charged particles.	Wires	A long thin piece of metal that is used to fasten things or to carry electric current.

Which appliances run on electricity?

- Some appliances use batteries and some use mains electricity.
- Batteries come in different sizes depending on how much and for long the appliance is used.
- Common appliances that use electricity:



It is important to take safety precautions when using electrical appliances or working with electricity.

Safety precautions include:

- Never using electrical equipment or appliances with wet hands.
- Never using electrical equipment that has frayed cords or wires.
- Never overloading plug sockets.
- Never putting fingers or other objects into wall sockets or electrical appliances.
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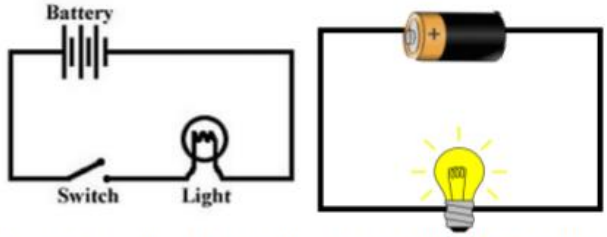
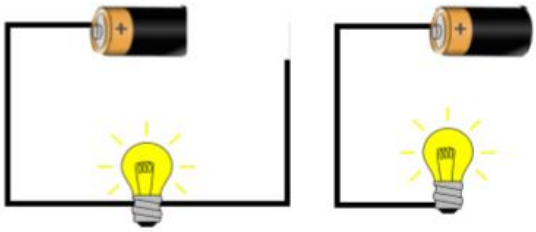
Electrical Circuits



These are complete **circuits** - they have a **battery (cell)** and a component (bulb).
The **wires** are placed in the right places of the **battery** for the circuit to work.



These **circuits** will not work as they are incomplete.

- A complete circuit is a loop that allows electrical current to flow through the wires.
- A circuit contains a battery (cell), wired and an appliance that requires electricity to work e.g. a bulb.
- The electrical current flows through the wires from the cell to the appliance.
- A switch can break or reconnect a circuit. The switch controls the flow of the electrical current around the circuit. When the switch is off, current cannot flow.

This is not the same as incomplete circuit.

Electrical Conductors and Insulators

- When objects are placed in the circuits, they may or may not allow electricity to pass through.
- Objects that are made from materials that allow electricity to pass through and create a complete circuit are called electrical conductors.
- Objects that are made from materials that do not allow electricity to pass through and do not complete a circuit are called electrical insulators.

Metal is used in plugs to allow electricity to transfer from the wall socket, through the plug, and into a device e.g. TV.

Plastic is an electrical insulator.
The plastic covering that surrounds wires stops you from getting an electric shock.

I can identify sources of electricity and the appliances that use it.	I can build and explain a complete circuit and describe what happens when it is incomplete.
I can investigate and explain which materials are conductors and which are insulators.	I can explain why a complete circuit needed for electricity to work?