Electricity Knowledge Organiser

Electricity is a form of energy. This energy is stored in batteries (also known as cells) or comes into our houses and other buildings along wires. Many items we use every day rely on electricity to work.

Smaller appliances, such as watches and phones, are powered by batteries. Larger products, for example freezers and washing machines, have to be plugged in to mains electricity.

A vacuum cleaner uses mains electricity.

A cell (battery)

Staying Safe

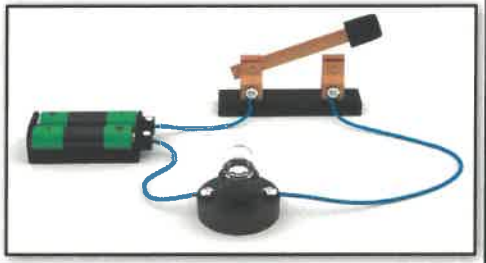
- Never stick anything apart from plugs into the holes in a socket. The electricity can give you a painful electric shock.
- Don't take electrical items into a damp environment like a bathroom.
- Never touch anything electrical with wet hands.
- Always ask an adult to change light bulbs.
- Always tell an adult if you think something is wrong with an electrical item.
- Keep out of power substations and any other area with the electricity warning sign. This is a black zigzag arrow on a yellow triangle.
- Do not fly kites near overhead power lines.

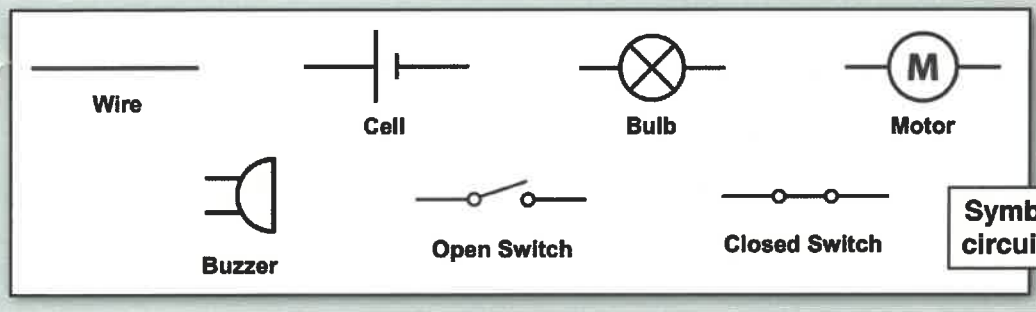
Circuits

In order for any electrical equipment to work, a circuit has to be created. A circuit allows the electrical current to flow from the negative terminal of the cell (battery) to the positive. The circuit must be complete or the electricity cannot flow and the item will not work.

A switch can be used to open and close a circuit. If the switch is open, the circuit is not complete. Closing the switch will complete the circuit.

Increasing the number and / or voltage of cells used in a circuit will increase the brightness of a lamp or the volume of a buzzer.





Symbols used in circuit diagrams.

Will the bulb light in the circuit above?

Conductors and Insulators

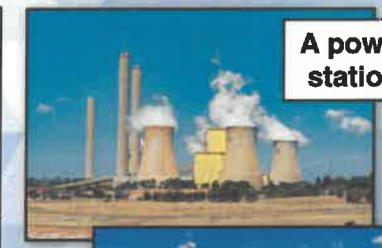
A conductor is a material that allows electricity to flow through it easily. Metals are good conductors of electricity, which is why the prongs on plugs (and electrical wires) are made of metal. Wires are also covered in a plastic or rubber cover for safety.

An insulator is a material that does not allow electricity to flow through it easily. Rubber and plastic are good insulators. Other good insulators include wood, glass and cotton.

This tape is used to insulate electrical wires.

These copper wires are covered in plastic.

Electricity Vocabulary	
battery	A container of one or more cells that stores electricity.
bulb	An electric lamp that provides light.
buzzer	An electrical object that makes a sound.
cable	A piece of wire that electricity can flow through.
cell	A device that stores electricity.
circuit	A closed path that electricity can flow around.
closed switch	A switch that breaks the circuit so that electricity cannot flow back to the cell.
conductor	A material that electricity can flow through easily.
current	The flow of electricity.
electric shock	A discharge of electricity through a human body.
electricity	A form of energy used to power items.
energy	Power that is used to do work.
generate	Producing electricity.
insulator	A material that electricity cannot flow through easily.
mains electricity	The electricity that is supplied to buildings through wires.
motor	A machine that is powered by electricity and causes motion.
open switch	A switch that completes the circuit so that electricity can flow back to the cell or battery.
plug	A device that can be plugged into a socket, allowing electricity to flow.
power station	A place where electricity is generated.
socket	A point where electrical items can be plugged into the mains.
static electricity	An electric charge that does not move. It is often produced by friction and can cause sparks or attract dust and hair.
switch	A device for completing or breaking a circuit.
terminal	The end of a cell or battery that connects with wires and other parts of a circuit.
voltage	The push that causes charges to move in a wire. It is measured in volts (v).
wind power	Power that is generated by the movement of the wind.
wire	A thin thread of metal that electricity can flow through.

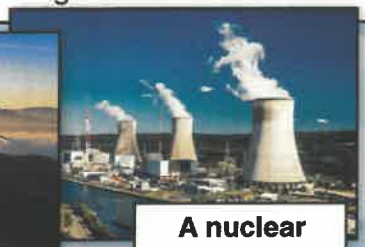


A power station

Solar panels

A hydro-electric dam

Wind turbines



A nuclear power station

Generating Electricity

Mains electricity is generated in a number of ways:

- Burning fossil fuels (such as gas or coal),
- Solar panels convert the sun's energy into electricity.
- Hydro-electric power harnesses the energy of water.
- Nuclear power uses the energy inside an atom.
- Turbines convert the wind's energy into electricity.
- Power can also be generated by burning waste.

Static Electricity

Have you ever tried rubbing a balloon on a wall to make it stick, or on your hair to make it stand up on end? That is static electricity. The charge is built up on the surface of an object. Unlike mains electricity, it does not flow in a current (hence the name static).

Lightning is caused by static electricity building up within rain clouds.

Static Electricity

Lightning