

Sithney C.P. School Knowledge Organiser



Science. Physics: Electricity

What you should already know:

Children know about similarities and differences in relation to places, objects, materials and living things.

Describe the simple physical properties of a variety of everyday materials.

Compare and group together a variety of everyday materials on the basis of their simple physical properties.

Key learning:

Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off.

Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity.

Key Vocabulary:

electricity - The flow of an electric current or charge through a material, e.g. from a power source through wires to an appliance.

electrical appliance/device - A piece of equipment or device designed to perform a particular job, such as a washing machine or mobile phone.

Plug – piece of electrical equipment that fits in to the holes of an electrical socket

electrical circuit - A pathway that electricity can flow around. It includes wires and a power supply and may include bulbs, switches or buzzers.

complete circuit – A circuit with no gaps.

short circuit – electricity strays outside the established pathway of an electrical **circuit**.

loose connection – an imperfect electrical circuit.

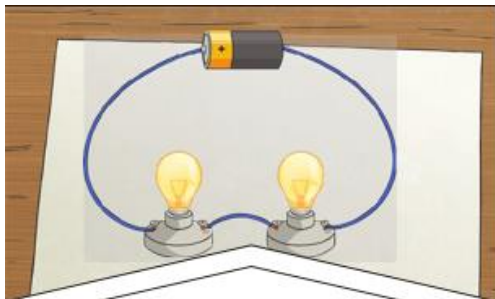
connect/connections – a direct wire for electricity between two points in a circuit.

Component – a basic part of an electrical circuit (wire, cell, bulb etc.)













cell / battery - A device that stores electrical energy as a chemical.

Positive - electricity of which the elementary unit is the proton.

Electrical Equipment and Symbols



Electricity can only flow around a complete **circuit** that has no gaps. There must be wires connected to both the positive and negative end of the power supply/**battery**.

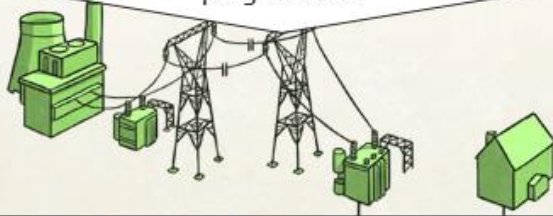
	Switch	
	Buzzer	
	Motor	
	Bulb	
	Cell	
	Battery	



Crocodile clip – used to make electrical connections

There are two types of electric current.

Mains **electricity**: power stations send an electric charge through wires to transformers and pylons. Then, underground wires carry the electricity into our homes via wires in the walls and out through plug sockets.



Battery **electricity**: batteries store chemicals which produce an electric current. Eventually, even rechargeable batteries will stop producing an electric current.



A conductor of **electricity** is a material that is made up of free **electrons** which can be made to move in one direction, creating an electric current. Metals are good conductors. Electrical insulators have no free **electrons** and so no electric current can be made. Wood, plastic and glass are good insulators.



Electrical Conductors

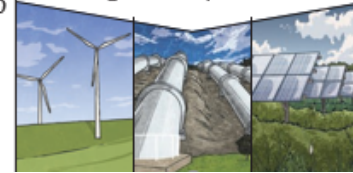
Electrical Insulators

Lightning and static **electricity** are examples of **electricity** occurring naturally but for us to use **electricity** to power **appliances**, we need to make it.



Coal, oil and natural gases are fossil fuels which, when burnt, produce heat which can be used to generate **electricity**.

Electricity can be generated from wind power used to turn windmills and hydroelectric power from water used in dams. The Sun's rays can be converted into **electricity** by solar panels.



Nuclear energy is created when atoms are split. This creates heat which can be used to generate **electricity**. Geothermal energy is heat from the Earth that is converted into **electricity**.

generate	To make or produce.
renewable	A source of electricity that will not run out. These include solar, nuclear, geothermal, hydro and wind.
non-renewable	This source of energy will eventually run out and so will no longer be able to be used to make electricity. These include fossil fuels – coal, oil and natural gas.

Switches can be used to open or close the **circuit**. When off, a switch 'breaks' the **circuit** to stop the flow of **electrons**. When the switch is on, the **circuit** is complete and the **electrons** are able to flow around the **circuit**.

