

## Electricity Knowledge Progression

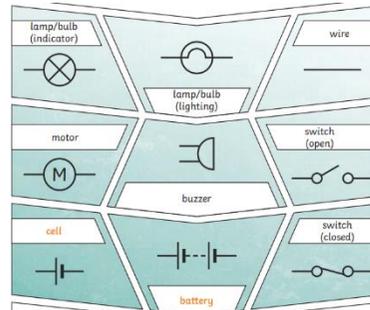
	Knowledge	Key Vocabulary
Nursery		
Reception		
Y1		
Y2		
Y3		
Y4	<p>Electricity is the flow of an electric current or charge through a material, e.g. from a power source through wires to an appliance. Lightning and static electricity are examples of electricity occurring naturally but for us to use electricity to power appliances, we have to make it. Many everyday appliances rely on electricity for them to work. Some appliances need to be plugged into a socket (mains electricity) and others have a battery to make them work</p> <p><b>How electricity can be generated</b></p> <ul style="list-style-type: none"> <li>- Coal, oil and natural gases are fossil fuels which, when burnt, produce heat which can be used to generate electricity (<a href="#">link to Y3 Coal Mining</a>) (non-renewable)</li> <li>- Wind can also generate electricity by turning windmills (renewable)</li> <li>- Water can also generate electricity. This is called hydroelectric power. (renewable)</li> <li>- The sun can also generate electricity by using solar panels (renewable)</li> <li>- Nuclear energy is created when atoms are split. This creates heat which generates electricity. (renewable)</li> <li>- Heat from the Earth can be turned into energy. This is called geothermal energy (renewable)</li> </ul> <p>There are two types of electric current: mains electricity and battery electricity.</p> <p><u>Mains Electricity</u> 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.</p> <p><u>Battery Electricity</u> Batteries store chemicals which produce an electric current. Eventually, even rechargeable batteries will stop producing an electric current.</p> <p><u>Circuits</u> 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. 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.</p> <p><u>Conductors and Insulators</u> (<a href="#">link to materials Y2</a>) 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. Insulators have no free electrons and so no electrical current can be made. Wood, plastic and glass are good insulators.</p>	<p><b>Electricity:</b> the flow of an electric current or charge through a material <b>Generate:</b> to make or produce <b>Renewable:</b> a source of energy that will not run out. These include solar, nuclear, geothermal, hydro and wind <b>Non-Renewable:</b> 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. <b>Appliances:</b> a piece of equipment or device designed to perform a particular job, such as a washing machine or mobile phone <b>Circuit:</b> A pathway that electricity can flow around. It includes wires and a power supply and may include bulbs, switches or buzzers <b>Bulb:</b> A bulb uses the electrical energy in the circuit to produce light <b>Buzzer:</b> A buzzer uses the electrical energy in the circuit to produce a sound <b>Motor:</b> A motor uses the electrical energy in the circuit to produce movement <b>Battery:</b> A device that stores electrical energy as a chemical</p>
Y5		
Y6	<p><b>Know that:</b> Making changes to circuits and their effects:</p> <ul style="list-style-type: none"> <li>• More batteries or a higher voltage create more power to flow through the circuit.</li> </ul>	<p><b>Symbol</b> A visual picture that stands for something else. <b>Cell/Battery</b> A device that stores energy as a chemical until it is needed. A cell is a single unit. A battery is a collection of cells. <b>Current</b> The flow of electrons, measured in amps.</p>

- Shortening the wires means the electrons have less resistance to flow through.
- Fewer batteries or a lower voltage give less power to the circuit.
- More buzzers or bulbs mean the power is shared by more components.
- Lengthening the wires means the electrons have to travel through more resistance.

**Series Circuit** - A circuit that has only one route for the current to take. If more bulbs or buzzers are added, the power has to be shared and so they will be dimmer or quieter. If just one part of this series circuit breaks, the circuit is broken and the flow of current stops.

To know what a 'broken' circuit means

Know and use the components of a circuit and their symbols.



**Amps** How electric current is measured.

**Voltage** The force that makes the electric current move through the wires. The greater the voltage, the more current will flow.

**Resistance** The difficulty that the electric current has when flowing around a circuit.

**Electrons** Very small particles that travel around an electrical circuit.