

Year 6 – Electricity	<p>Main Outcomes:</p> <ul style="list-style-type: none"> Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram. 	Focus: Science – physics
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<p>What should I already know?</p> <ul style="list-style-type: none"> The identities and names of some appliances that require electricity to function. How to construct a series circuit, and name its components (cells, wires, bulbs, switches, motors and buzzers). How to draw a circuit diagram. To predict and test whether a lamp will light within a circuit. The function of a switch in a circuit. The difference between a conductor and an insulator, and examples of each.
<p>What I will do</p> <p>I will have weekly or blocked science lessons. In lessons, I will be taught a skill and I will gain knowledge and understanding through the process of scientific enquiry (observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources).</p> <p><u>Possible lines of enquiry</u></p> <ul style="list-style-type: none"> Building on their work in year 4, construct simple series circuits, to help answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. Learn how to represent a simple circuit in a diagram using recognised symbols. Systematically identify the effect of changing one component at a time in a circuit. Design and make a set of traffic lights, a burglar alarm or some other useful circuit. <p>Note: Pupils are expected to learn only about series circuits, not parallel circuits. They should be taught to take the necessary precautions for working safely with electricity.</p>
<p>Resources</p> <p>Hamilton Science planning: electricity https://www.hamilton-trust.org.uk/science/year-6-science/electric-celebrations/ (all planning also saved on SharePoint).</p>

Vocabulary	Meaning
appliances	a device or machine in your home that you use to do a job
battery	a sort of container that stores energy until it is needed (technically, a battery is more than one cell)
bright/dim	emitting (giving out) a high or low amount of light
bulb	a circuit component that gives out light when electricity goes through it
buzzer	a component in a circuit that makes a sound when electricity goes through it
cell	a container that converts chemical energy into electrical energy
circuit	a loop of wires and components , which electricity can flow around
circuit diagram	a graphical representation of an electrical circuit
circuit symbol	a symbol rather than a picture, used to represent circuit components
complete circuit	a circuit with no gaps
components	something that does a job in a circuit , e.g. a bulb , buzzer or motor
conductor	a material that electricity can pass through, e.g. a metal
connection	where a wire meets a component in the circuit
crocodile clip	a plier-like spring-tensioned metal clip with elongated, serrated jaws that is used for creating a temporary electrical connection
current	an electrical flow caused when electrons move through a conductor and carry electrical energy from one place to another place
device	a piece of equipment or a mechanism designed to serve a special purpose or perform a special function
dimmer switch	a switch that allows you to gradually change the brightness of an electric light
electricity	the flow of energy in the form of tiny particles called electrons
enquiry question	an open-ended question that engages students in thinking about the ways in which they might answer it or go about finding answers
findings	conclusions reached as the result of an investigation or enquiry
flow	to move in a smooth, steady stream
insulator	a material that electricity cannot pass through, e.g. wood
investigation	to observe or study closely
loose connection	an imperfect electrical connection
motor	a self-contained device that converts electrical, chemical, or nuclear energy into mechanical energy (movement)
resistance	a measure of how much the flow of electricity is restricted within a circuit
short circuit	when the current going through wires does not travel the correct path
switch	a component in a circuit which enables the flow of electricity to be turned on and off
voltage	a measure of how strong the current is in a circuit
wire	a thin piece of metal that can be bent

Knowledge to understand		Skills to learn																					
<p>Circuit diagrams use symbols rather than pictures.</p>	<table border="1"> <tr> <td></td> <td>BULB (LAMP) A component which lights up when electricity passes through it in a circuit</td> <td></td> </tr> <tr> <td></td> <td>MOTOR A component which moves (spins) when electricity passes through it in a circuit</td> <td></td> </tr> <tr> <td></td> <td>BUZZER A component which makes a sound when electricity passes through it in a circuit</td> <td></td> </tr> <tr> <td></td> <td>WIRE Plastic-coated electrical wire which conducts electricity around a circuit</td> <td></td> </tr> <tr> <td></td> <td>SWITCH Part of a circuit which can easily be opened or closed to control the flow of electric current</td> <td></td> </tr> <tr> <td></td> <td>CELL – 1 battery A safe power source. A store of chemical potential energy that can power a circuit</td> <td></td> </tr> <tr> <td></td> <td>CELL – 2 batteries Two cells used together to make a more powerful power source</td> <td></td> </tr> </table>		BULB (LAMP) A component which lights up when electricity passes through it in a circuit			MOTOR A component which moves (spins) when electricity passes through it in a circuit			BUZZER A component which makes a sound when electricity passes through it in a circuit			WIRE Plastic-coated electrical wire which conducts electricity around a circuit			SWITCH Part of a circuit which can easily be opened or closed to control the flow of electric current			CELL – 1 battery A safe power source. A store of chemical potential energy that can power a circuit			CELL – 2 batteries Two cells used together to make a more powerful power source		<ul style="list-style-type: none"> ➤ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary ➤ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate ➤ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ➤ using test results to make predictions to set up further comparative and fair tests ➤ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ➤ identifying scientific evidence that has been used to support or refute ideas or arguments
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<p>Changing the components in a circuit can affect the brightness of a bulb, the volume of a buzzer or the speed of a motor.</p>	<p>The more cells that are added or the higher the voltage of the cell:</p> <ul style="list-style-type: none"> • the brighter the bulb • the louder the buzzer • the faster the motor <p>The more bulbs/buzzers/motors that are added to a circuit:</p> <ul style="list-style-type: none"> • the dimmer the bulbs • the quieter the buzzers • the slower the motors 																						
<p>Switches control the flow of electricity in a circuit.</p>	<p>For electricity to flow, the circuit needs to be complete (have no gaps) and have a power source, such as a cell.</p> <p>A closed switch completes the circuit so electricity can flow.</p> <p>An open switch creates a gap in the circuit so electricity can't flow (providing the user control with).</p>																						
Equipment to become familiar with		<p>Cells ('batteries')</p> <p>Wires</p> <p>Crocodile clips</p> <p>Bulbs, buzzers, motors, lightbulbs, switches</p>																					

Evidence of Learning	How will I know what I've learnt?
<p>Science books</p> <p>Photos</p> <p>Videos</p> <p>Pupil conferencing</p> <p>Teaching and learning observations</p> <p>Learning walks</p> <p>Data analysis</p>	<p>See KS2 teacher assessment exemplification for science</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/763065/2018_key_stage_2_teacher_assessment_exemplification_science.pdf</p> <p>See also Hamilton Science_Assessment_Y6 (saved in planning folder on Sharepoint).</p> <p>KS2 quizzes:</p> <p>https://gcequiz.com/quiz/ks2-science-quizzes</p> <p>https://churchfieldsjunior.com/test-your-skills-science/</p>