

<b>Year 4 – Electricity</b>	<b>Main Outcomes:</b> <ul style="list-style-type: none"> <li>Identify common appliances that run on electricity.</li> <li>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</li> <li>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.</li> <li>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</li> <li>Recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>	<b>Focus: Science – physics</b>
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<b>What should I already know?</b>
Not studied until year 4.
<b>What I will do</b>
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).
<u>Possible lines of enquiry</u> <ul style="list-style-type: none"> <li>Construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches.</li> <li>Use their circuits to create simple devices.</li> <li>Draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6.</li> <li>Observe patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.</li> </ul>
Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage.
<b>Pupils should be taught about precautions for working safely with electricity.</b>
<b>Resources</b>

Vocabulary	Meaning
appliance	a <b>device</b> or machine in your home that you use to do a job
battery	a sort of container that stores <b>energy</b> until it is needed (technically, a <b>battery</b> is more than one cell)
bulb	a <b>circuit component</b> that gives out light when <b>electricity</b> goes through it
buzzer	a <b>component</b> in a <b>circuit</b> that makes a sound when <b>electricity</b> goes through it
cell	a container that converts chemical <b>energy</b> into electrical <b>energy</b>
circuit	a loop of <b>wires</b> and <b>components</b> , which <b>electricity</b> can <b>flow</b> around
component	something that does a job in a <b>circuit</b> , e.g. a <b>bulb</b> , <b>buzzer</b> or <b>motor</b>
conductor	a material that <b>electricity</b> can pass through, e.g. a metal
crocodile clip	a plier-like spring-tensioned metal clip with elongated, serrated jaws that is used for creating a temporary <b>electrical</b> connection
current	an electrical <b>flow</b> caused when electrons move through a <b>conductor</b> and carry electrical <b>energy</b> 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
electricity	the <b>flow</b> of <b>energy</b> in the form of tiny particles called electrons
electrocute	anything from minor discomfort to serious injury caused by touching something connected to a source of <b>electricity</b>
energy	the ability to do work
flow	to move in a smooth, steady stream
insulator	a material that <b>electricity</b> cannot pass through, e.g. wood
mains	the <b>electricity</b> that is delivered to homes and businesses through an electric grid
plug	a small plastic object with two or three metal pins which fit into the holes of an electric <b>socket</b>
power	a source or means of supplying <b>energy</b>
safety	anything that people do to protect themselves or others from harmful accidents
socket	a <b>device</b> or point in a wall where you can connect electrical equipment to the <b>power</b> supply
switch	a <b>component</b> within an electrical <b>circuit</b> which enables the <b>flow</b> of <b>electricity</b> to be turned on and off
wire	a thin piece of metal that you can bend

Hamilton Science planning: electricity <https://www.hamilton-trust.org.uk/science/year-4-science/electricity-its-electric/> (all planning also saved on SharePoint).

Knowledge to understand		Skills to learn
<p>Many <b>devices</b> work by using <b>electricity</b> from <b>batteries</b> or the <b>mains</b>.</p>		<ul style="list-style-type: none"> <li>➤ asking relevant questions and using different types of scientific enquiries to answer them</li> <li>➤ setting up simple practical enquiries, comparative and fair tests</li> <li>➤ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>➤ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>➤ using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>➤ using straightforward scientific evidence to answer questions or to support their findings.</li> </ul>
<p><b>Electricity</b> can be very dangerous, so you need to work safely with it.</p>	<p>The dangers are often associated with materials that are good <b>conductors</b>.</p> <ul style="list-style-type: none"> <li>Ø <b>never</b> stick anything apart from a plug into a <b>mains socket</b></li> <li>Ø <b>never</b> use <b>electricity</b> near water</li> </ul>	
<p>That a simple <b>circuit</b> requires a <b>cell</b> and <b>wires</b> connected to both ends of the <b>cell</b>.</p>		
<p>For a <b>bulb</b> to light/<b>buzzer</b> to sound/<b>motor</b> to spin, it must be in a <b>circuit</b> which is complete and has a <b>battery/cell</b>.</p>	<p>A <b>bulb</b> will not light/<b>buzzer</b> will not sound/<b>motor</b> will not spin if, for example:</p> <ul style="list-style-type: none"> <li>• the <b>circuit</b> has no <b>battery/cell</b></li> <li>• there is a gap in the <b>circuit</b></li> <li>• the <b>switch</b> is open</li> </ul>	
<p><b>Conductors</b> allow <b>electricity</b> to pass through them, but <b>insulators</b> do not.</p> <p>Metals are good <b>conductors</b>.</p>	<p>Examples of <b>conductors</b> include iron nails, silver spoons, steel paperclips and aluminium foil.</p> <p>Examples of <b>insulators</b> include rubber bands, wooden rulers, plastic toys and glass windows.</p> <p>You can test whether or not something is a good <b>conductor</b> by putting it in a <b>circuit</b>.</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><a href="https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/763065/2018_key_stage_2_teacher_assessment_exemplification_science.pdf">https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/763065/2018_key_stage_2_teacher_assessment_exemplification_science.pdf</a></p> <p>See also Hamilton Science_Assessment_Y4 (saved in planning folder on Sharepoint).</p> <p>KS2 quizzes:</p> <p><a href="https://gcequiz.com/quiz/ks2-science-quizzes">https://gcequiz.com/quiz/ks2-science-quizzes</a></p> <p><a href="https://churchfieldsjunior.com/test-your-skills-science/">https://churchfieldsjunior.com/test-your-skills-science/</a></p>