



# LKS2 Design Technology: Electrical systems Spring 1

Overview	
<b>Simple Circuits</b>	
<p><u>Electricity is a type of energy. It is used to power lots of things</u></p> <p>-Electricity can flow through <u>wires and cables</u>. It can also be stored in <u>batteries or cells</u>.</p> <p>-Electricity can flow through <u>circuits</u>. A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow.</p> <p>The electricity flowing through a circuit is known as the current. The current can be deliberately allowed to flow or broken using a <u>switch</u>.</p> <p>-Some materials conduct electricity (<u>conductors</u>), whilst others do not (<u>insulators</u>).</p>	

Designing		Key Vocabulary
<p>-You need to think about <u>who your product is for</u> – what is its purpose and who is <u>going to use it?</u></p> <p>-Consider the <u>materials</u> that you will use – what type of input device (e.g. battery/cell), conductor (e.g. wires) and output device (e.g. bulb) are best for your purpose and audience?</p> <p>-Consider whether to create a <u>homemade switch</u> or use a <u>bought switch</u>. Different switches work in different ways (see below) – think about which will be the most accessible/ appealing to your user.</p> <p>As a part of the design process, you should be able to sketch and annotate different ideas. You should also be able to plan the main stages of making, using either a checklist, a storyboard, or a flowchart.</p>		<ul style="list-style-type: none"> <li>Simple Circuit</li> <li>Switch</li> <li>Current</li> <li>Short Circuit</li> <li>Battery/ Cell</li> <li>Switch</li> <li>Input/ Output Device</li> <li>Conductor</li> <li>Insulator</li> </ul>

Example of Battery-Powered Products		
	Simple Circuit	<p>-A <u>simple circuit</u> is a closed loop of a conductor material, e.g. wire, in which electricity can travel in a current. In order for it to be a closed circuit, a power source e.g. battery/cell is needed (input device), and something that is powered by the electricity, e.g. light bulb (output device). A switch can be used to break the circuit (turning the output device off).</p>
	Torch	<p>-A <u>torch</u> is one of the simplest forms of a battery-powered product. Torches are useful when the source of light needs to be portable, or when it needs to be operated by children.</p> <p>When the switch is pressed, a conductor material is positioned into a circuit, making it a closed circuit, thus powering the light bulb.</p>
	Handheld Fan	<p>-<u>Handheld fans</u> are another example of a simple battery-powered electrical system in action. Once again, it is the perfect option for someone who needs to keep cool where there is no safe/ practical mains option available. Rather than powering a bulb, the closed circuit powers the propeller, which blows air.</p>

Making & Evaluating	
<p><b>Making Electrical Systems</b></p> <p>-In order to ensure that your circuit is closed, it is hugely important that your connections are secure.</p> <p>-Connecting blocks and bulb holders are useful pieces of equipment for ensuring this.</p> <p>-Twisting strands of wire and taping wire are also useful strategies for creating a secure connection.</p>	<p><b>Evaluating</b></p> <p>-How well does your electrical system <u>work</u>? Does it work as planned?</p> <p>-Does it meet its <u>purpose</u>?</p> <p>-What would your audience think about your product? What would they like about it? What would they not like?</p> <p>-What type of switch did you choose to use? Why? What are the pros and cons of this type of switch?</p> <p>What problems did you encounter? How did you fix them?</p> <p>What could you still improve about your product? How would you do things differently next time?</p>
<p><b>Switches</b></p> <p>-Homemade switches can be made using this equipment:</p> <p>-A range of bought switches can also be used. <u>Reed switches</u> operate by magnets, whereas <u>toggle switches</u> use a lever. <u>Push-to-break</u> switches are turned off by pressing them. <u>Push-to-make</u> switches are turned on by pressing them.</p>	

## HEALTH and SAFETY

- Remove any jewellery and tie back long hair. Wear an apron.
- Do not put fingers or objects in outlets.
- Never use anything with a plug, wire or cord around water.
- Keep metal objects away from electrical heat sources – e.g. knife away from toaster.
- Never pull a plug out by its cord.
- Follow electrical signs and guidance carefully.
- Return all equipment to the correct zoned areas of the classroom/ workshop.
- Remember that electricity can cause burns, shocks, serious injury & even death.

circuit	switch	conductor	insulator	system	current
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