

# Electricity

## Science Knowledge Organiser Year 4 Term 5

### Key questions

Where does electricity come from?  
 Which appliances run on electricity?  
 How does a circuit work?  
 What are electrical conductors and insulators?

### Key people

**Thomas Edison** (1847 – 1931) – was an American inventor and a business man. Famous for inventing the first working lightbulb.

**Joseph Swan** (1828 –1914) was an English physicist, chemist, and inventor. He is known as an independent early developer of a successful incandescent light bulb.

### Key Knowledge

What I should know already...

- Electricity is a form of energy that can be carried by wires and is used for heating and lighting, and to provide power for devices.
- Sources of light and sound may need electricity to work.

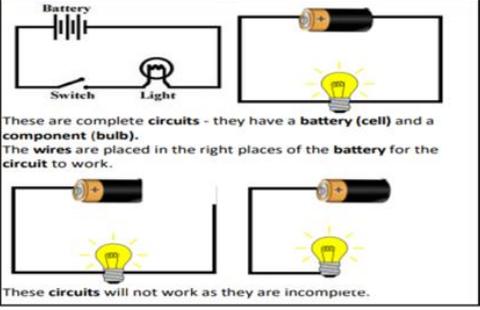
#### What I will know at the end of this unit

Where does <b>electricity</b> come from?	<ul style="list-style-type: none"> <li><b>Electricity is generated</b> using <b>energy</b> from natural sources such as the Sun, oil, water and wind.</li> <li>These can also be called <b>fuel sources</b>.</li> </ul>	How does a <b>circuit</b> work?	<ul style="list-style-type: none"> <li>A complete <b>circuit</b> is a loop that allows <b>electrical current</b> to flow through <b>wires</b>.</li> <li>A <b>circuit</b> contains a <b>battery (cell)</b>, <b>wires</b> and an <b>appliance</b> that requires <b>electricity</b> to work (such as a <b>bulb</b>, <b>motor</b> or <b>buzzer</b>).</li> <li>The <b>electrical current</b> flows through the wires from the <b>battery (cell)</b> to the <b>bulb</b>, <b>motor</b> or <b>buzzer</b>.</li> <li>A <b>switch</b> can break or reconnect a <b>circuit</b>.</li> <li>A <b>switch</b> controls the flow of the <b>electrical current</b> around the <b>circuit</b>. When the <b>switch</b> is off, the <b>current</b> cannot flow. This is not the same as an <b>incomplete circuit</b>.</li> </ul>
Which <b>appliances</b> run on <b>electricity</b> ?	<ul style="list-style-type: none"> <li>Some <b>appliances</b> use <b>batteries</b> and some use <b>mains electricity</b>.</li> <li><b>Batteries</b> come in different sizes depending on how much and for how long the <b>appliance</b> is used.</li> <li>Common <b>appliances</b> that use <b>electricity</b>.</li> </ul> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> toaster</div> <div style="text-align: center;"> lamp</div> <div style="text-align: center;"> kettle</div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> laptop</div> <div style="text-align: center;"> X-box</div> <div style="text-align: center;"> phone</div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> torch</div> <div style="text-align: center;"> headlights</div> <div style="text-align: center;"> television</div> </div>	What are <b>electrical conductors</b> and <b>insulators</b> ?	<ul style="list-style-type: none"> <li>When objects are placed in the <b>circuits</b>, they may or may not allow <b>electricity</b> to pass through.</li> <li>Objects that are made from materials that allow <b>electricity</b> to pass through a create a complete <b>circuit</b> are called <b>electrical conductors</b>.</li> <li>Objects that are made from materials that do not allow <b>electricity</b> to pass through and do not complete a <b>circuit</b> are called <b>electrical insulators</b>.</li> </ul>

### Useful web links

Online electric circuit builder: <https://www.learningcircuits.co.uk/> (tablet friendly)  
 Circuit construction kit: [https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc\\_en.html](https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html)

### Diagrams



### Key vocabulary

**Electricity** - a form of energy that can be carried by wires and in used for heating and lighting, and to provide power for devices.

**Electrical appliance** - a device or machine in your home that you use to do a job such as cleaning or cooking. Appliances are often electrical.

**Device** - an object that has been invented for a particular purpose.

**Mains** - where the supply of water, electricity, or gas enters a building.

**Electrical circuit** - a complete route which an electric current can flow around.

**Component** - the parts that something is made of.

**Cell** - a synonym for battery.

**Battery** - a small device that provide the power for electrical items such as torches or wall clocks.

**Electrical conductor** - a material that allows electricity to flow through it e.g. metals.

**Electrical insulator** - a material which does not allow electricity to flow through it e.g. wood or plastic.