



Unit Overview: LKS2 Science

Electricity

<p><u>National Curriculum Objectives</u></p> <ul style="list-style-type: none"> ❖ Identify common appliances that run on electricity. ❖ Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. ❖ 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. ❖ Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. ❖ Recognise some common conductors and insulators, and associate metals with being good conductors. 	<p><u>Substantive knowledge</u></p> <ul style="list-style-type: none"> ❖ Know that many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. ❖ know that an electrical circuit consists of a cell or battery connected to a component using wires. ❖ Understand that if there is a break in the circuit, a loose connection or a short circuit, the component will not work. ❖ Know that a switch can be added to the circuit to turn the component on and off. ❖ Know that metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity. 	<p><u>Vocabulary</u></p> <p>electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol</p> <p><u>Phonics / polysyllabic words</u></p> <p>Electricity (c/y) circuit (ui) connection (tion) conductor (or)</p>
<p><u>Working Scientifically Skills</u></p> <ul style="list-style-type: none"> ❖ asking relevant questions and using different types of scientific enquiries to answer them ❖ setting up simple practical enquiries, comparative and fair tests ❖ making systematic and careful observations ❖ gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ❖ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 	<p><u>Disciplinary knowledge</u></p> <ul style="list-style-type: none"> ❖ Communicate structures of circuits using drawings which show how the components are connected. ❖ Use classification evidence to identify that metals are good conductors and non-metals are insulators ❖ Be able to incorporate a switch into a circuit to turn it on and off. 	<p><u>Reading support</u></p> <ul style="list-style-type: none"> ❖ Word mats ❖ Scaffolded recording / choice of recording ❖ Pre teaching of vocab <p><u>Extension deeper thinking</u></p> <ul style="list-style-type: none"> ❖ What are the differences between appliances that run on mains electricity or batteries? ❖ What are the functions of each component within a circuit? ❖ Why is graphite an electrical conductor? ❖ Why does the bulb not light with a different arrangement of the circuit?
<p><u>Possible misconceptions</u></p> <p>Some children may think:</p> <ul style="list-style-type: none"> ❖ electricity flows to bulbs, not through them ❖ electricity flows out of both ends of a battery ❖ electricity works by simply coming out of one end of a battery into the component. 		



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		<p><u>Key People</u></p> <ul style="list-style-type: none"> ❖ Thomas Edison (electric bulb) ❖ Tristan Canfer (NUSTEM Person of the week): Electronic Engineering Apprentice ❖ Michael Faraday (Physicist) ❖ Hertha Ayrton (Electrical engineer and suffragette)
<p><u>Prior learning</u> Explore how things work. (Nursery – Electricity)</p> <p><u>Future learning</u></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. (Y6 - Electricity) ❖ 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. (Y6 - Electricity) ❖ Use recognised symbols when representing a simple circuit in a diagram. (Y6 - Electricity) 	<p><u>British Values</u></p> <ul style="list-style-type: none"> ❖ <u>Democracy</u> Take the views and opinions of others into account. Take turns and instructions from others. ❖ <u>The rule of law</u> Understand the importance of safety rules when working scientifically make choices when planning an investigation as others may have different points of view as to where to start. ❖ <u>Tolerance</u> Scientific discoveries have come from other cultures and religious beliefs often compete with scientific understanding. ❖ <u>Mutual respect</u> Work as a team, discuss findings and Offer support and advice to others. 	<p><u>Christian Values</u></p> <p><u>Courage</u></p> <ul style="list-style-type: none"> ❖ Ask our own questions to support our own understanding of the world and understand that sharing ideas, data, and results (for further testing and development by others) is a key principle of the scientific method. <p><u>Respect</u></p> <ul style="list-style-type: none"> ❖ Supporting other’s ideas, even if they differ to our own. ❖ Explore and celebrate research and developments that take place in many different cultures, both past and present. ❖ Explore how scientific discoveries have shaped the beliefs, cultures and politics of the modern world. <p><u>Trust</u></p> <ul style="list-style-type: none"> ❖ Celebrate everyone’s unique ideas and working together collaboratively.