

L Asghar

Subject –~~Science Summer 2~~ Year 4 Electricity continued

TAPS Assessment: Circuit Products

Key vocabulary: Electricity, 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

National Curriculum	Week	NC - Coverage	Disciplinary Knowledge	Substantive Knowledge	Activity Outline
---------------------	------	---------------	------------------------	-----------------------	------------------

<p>The national curriculum for Science aims to ensure that all pupils:</p> <p>Working Scientifically Lower KS2 pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</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 and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers § gathering, recording, classifying and presenting data in a variety of ways to help answer questions. 	<p style="text-align: center;">1</p>	<p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors</p>	<p>I can apply my knowledge of conductors and insulators to design different types of switch.</p> <p>I can report on findings from enquiries, including oral and written explanations, displays or presentations of results.</p>	<p>I know that a switch can be added to the circuit to turn the component on and off.</p> <p>I know that metals such as aluminium and copper are good conductors.</p> <p>I know materials such as wood and plastic (Non-metallic solids) are insulators except for graphite (pencil lead).</p>	<p>Children to complete their 'meet the scientist' session and KWL grid based on their previous understanding of electricity from Summer 1 – this should now be much secure. Give children a selection of materials to design their own 'home-made switches' – see PLAN Electricity pg 12 for examples and ask children to explain why they know their switch will work. Children to understand that the switches will work if the wires are connected to conductors but will not work if they are attached to an insulator. Children to present their findings orally.</p>
--	--------------------------------------	--	--	--	---

<p>§ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>§ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions § using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>§ identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>Using straightforward scientific evidence to answer questions or to support their findings.</p>	<p>2</p>	<p>Recognise some common conductors and insulators, and associate metals with being good conductors</p>	<p>I can set up and investigate a range of circuits</p>	<p>I know an electrical circuit consists of a cell or battery connected to a component using wires.</p> <p>I know if there is a break in the circuit, a loose connection or a short circuit, the lamp will not light up.</p>	<p>CT provide children with a lamp and battery and ask them if they can make the lamp light up without using wires. Ensure children understand the terms 'open circuit' 'closed circuit' 'electrical conductor' and 'electrical insulator'. Provide children with suitable materials to test their models e.g. paperclips, tin foil</p>
<p>§ identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>Using straightforward scientific evidence to answer questions or to support their findings.</p>	<p>3</p>	<p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>TAPS assessment Circuit Products</p>	<p>I can draw simple conclusions, suggest improvements and raise further questions</p>	<p>I know that a switch can be added to a simple series circuit to turn the lamp on and off.</p> <p>I know an electrical circuit consists of a cell or battery connected to a component using wires</p>	<p><i>Today we will be electrical engineers.</i></p> <p>Ask pairs to recap previous lessons on circuits by making a bulb light with a simple circuit (e.g. battery, bulb and 2 crocodile-clip wires - no rechargeable batteries because they get hot). Discuss possible designs for using a circuit in a product e.g. circuit bug/butterfly, Christmas decoration, clown face, light house. . .</p> <p>Support the children to design and make their own circuit product.</p> <p>Talk with the children about how they are adapting their designs to ensure the circuit works inside the product. They can take and annotate photos/drawings, or explain to you how they made them work.</p>

<p><u>Subject Content</u></p> <p>Pupils should be taught to:</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>School Context</u></p>	<p>4,5,6</p>	<p>Opportunities for consolidation lessons alongside enrichment activities - Year 4 Science planner to liaise with Science Lead.</p>				

Incorporating circuits into 3D models
(Design and Technology)

N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.

Common Misconceptions

Some children may think:

- 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