# Science

## Year 4 - Spring 1-Electricity

| *National Curriculum / End Point statement* |
|---|
| ***Electricity*** <br>• *Identify common appliances that run on electricity.* <br>• *Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.* <br>• *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.* <br>• *Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.* <br>• *Recognise some common conductors and insulators, and associate metals with being good conductors.* <br>***Working Scientifically*** <br>• *asking relevant questions and using different types of scientific enquiries to answer them* <br>• *setting up simple practical enquiries, comparative and fair tests* <br>• *making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers* <br>• *gathering, recording, classifying and presenting data in a variety of ways to help in answering questions* <br>• *recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables* <br>• *reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions* <br>• *using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions* <br>• *identifying differences, similarities or changes related to simple scientific ideas and processes* <br>• *using straightforward scientific evidence to answer questions or to support their findings.* |

| *Step 1* | *Step 2* | *Step 3* | *Step 4* | *Step 5* | *Step 6 (TAPS)* |
|---|---|---|---|---|---|
| *Reactivate learning: properties of materials* <br><br>*WALT identify common appliances that run on electricity* | *WALT construct a simple circuit* | *WALT predict whether a circuit will work* | *WALT investigate switches in a circuit* | *WALT recognise conductors and insulators* | *WALT investigate conductors and insulators* |

# Science

## Year 4 - Spring 1-Electricity

| Success Criteria | | | | | |
|---|---|---|---|---|---|
| I know what electricity is<br>I know what an appliance is<br>I know how the appliance is powered<br>I can tell you about a cell/battery<br>I know that a socket provides electricity | I can create a simple working circuit<br>I can name the components of the circuit<br>I can explain how the electricity gets from the cell to the bulb<br>I know that a cell has a positive and negative terminal | I can say whether a circuit will work or not<br>I can draw a pictorial representation of a circuit *(circuit symbols are not introduced until year 6)*<br>I can explain why the circuit will/will not work<br>I can ensure that it is a fair test – use fair test boards | I can tell you what a switch is<br>I know what an open circuit is and what a closed circuit is<br>I can predict whether a lamp will light up or not | I know what a conductor is<br>I know what an insulator is<br>I can name some examples of a conductor<br>I can name some examples of an insulator | I can use my knowledge of circuits to test whether a material is a conductor or an insulator<br>I can make sure that my test is fair<br>I can tell you what I have found out |
| **Suggested Outcome** | | | | | |
| Children can name common appliances and | Children create working circuits with a variety of components introduced one at a time. | Children can make a simple circuit and add in strips of metal, wood, straw etc<br>Teacher to model using a pencil – describe what is happening. | Children could build a simple game using their knowledge of circuit components.<br>They can further explore the use of switches and explain why the switch has to be closed for the circuit to work. | Children sort into insulators and conductors and begin to give examples of each. | Children investigate which everyday objects are conductors and which ones are insulators using their knowledge of circuits. Record fair testing and conclusion. |

| Vocabulary | NC links |
|---|---|
| Appliances, Electricity, Circuits, Cells, Wires, Bulbs, Switches, Buzzers, Lamp, Light , Loop, Battery, Switch, Series circuit, Conductors, Insulators | DT – electrical systems<br>Science – properties of materials |

**Key Learning**

Many household devices and appliances run on electricity. Some plug into the mains and others run on batteries. An electrical circuit consists of a cell or battery (a collection of cells) connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off.
Metals are good conductors so they can be sued as wires in a circuit. Non-metallic solids are insulators (except for graphite). Water, if not completely pure, also conducts electricity.

| Possible Evidence | Common Misconceptions |
|---|---|
| • Children can name the components of a circuit<br>• Children can make a working electrical circuit<br>• Children can control a circuit using a switch<br>• Children can name some metals that are conductors<br>• Children can name materials that are insulators | Some children may think:<br>• Electricity flows to bulbs, not through them.<br>• Electricity flows out of both ends of a battery<br>• Electricity works by simple coming out of one end of a battery and into the component |

# Science

## Year 4 - Spring 1-Electricity

| Notable Scientists |
| --- |
| Michael Faraday<br>Thomas Edison<br>Joseph Swan |
| **CPD opportunity** |
| https://www.reachoutcpd.com/courses/upper-primary/electricity/ |
| **Useful Links** |
| • https://app.discoveryeducation.co.uk/learn/channels/channel/ee2be023-21c5-45af-aa39-a0d80577e499<br>• https://app.discoveryeducation.co.uk/learn/channels/channel/d4d550d2-2f0e-4a30-8593-ed4cd4a7a524<br>• https://www.bbc.co.uk/bitesize/topics/zj44jxs |

### Electricity

| | |
| --- | --- |
| **Early learning goal** | • Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes. |
| **Year 1** | |
| **Year 2** | |
| **Year 3** | |
| **Year 4** | • Identify common appliances that run on electricity.<br>• Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.<br>• 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.<br>• Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.<br>• Recognise some common conductors and insulators, and associate metals with being good conductors. |