



Year 4 Science

Electricity

Things you should already know;

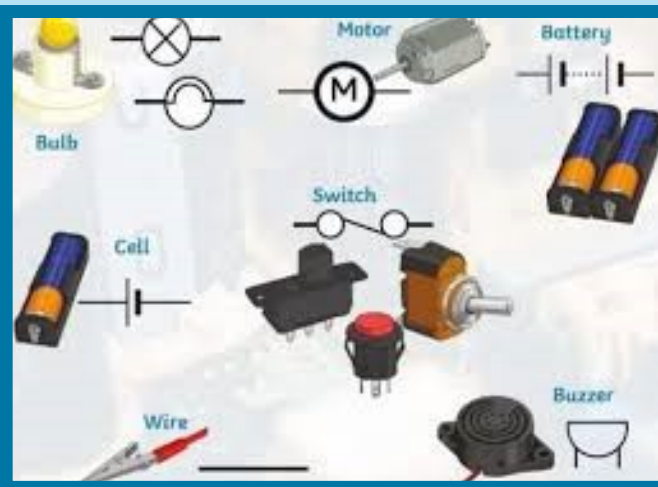
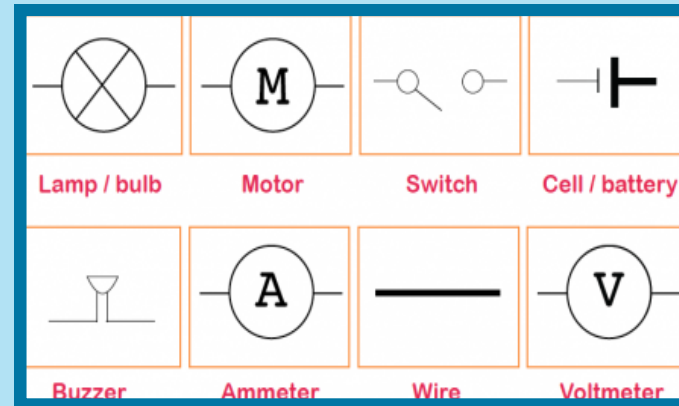
- That materials have different uses and different properties.
- Electricity can be used to create a source of light

Key Knowledge

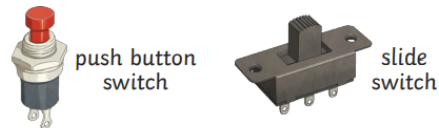
- To identify what material makes a good conductor or insulator
- To test conductors and insulators by creating a simple circuit.
- To identify the components in a simple circuit.
- To test whether a circuit is complete and how to control the flow of electricity around the circuit using a switch.
- To identify common household appliances that run on electricity and whether the electricity is mains supplied or battery powered.
- To understand about how to work safely with circuit components in the classroom.

New Learning for Year 4.

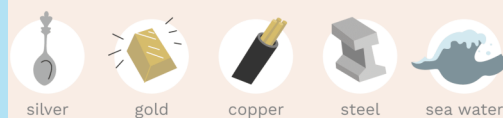
- That common appliances run on electricity
- How to construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- To be able to investigate whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- That a switch opens and closes a circuit and what is required to light a bulb in a simple series circuit
- To know that some materials are conductors and insulators, and know that metals are good conductors.



Switches can be used to open or close a **circuit**. When off, a switch 'breaks' the **circuit** to stop the flow of **electricity**. When on, a switch 'completes' the **circuit** and allows the **electricity** to flow.



5 Electrical Conductors



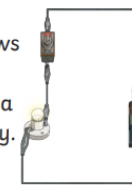
5 Electrical Insulators



Series Circuit

A **circuit** where the components are connected in a loop.

Electricity flows through each component in a single pathway.



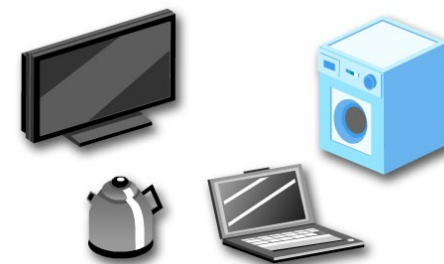
Complete Circuit



Electricity can flow. The components will work.

Incomplete Circuit

There is a break in the **circuit** that prevents the **electricity** from flowing. The components will not work.



Mains and Battery Powered





Year 4 Science

Electricity

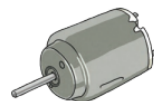
Key Vocabulary

Electricity	The flow of an electrical current through a material eg: from a power source through wires to an appliance..
Appliances	A piece of equipment or a device designed to perform a particular job such as a washing machine or mobile phone.
Battery	A device that stores electrical energy as a chemical. Two or more cells joined together form a battery.
Circuit	A pathway that electricity can flow around. It is based around wires and a power supply. Examples of components (parts) you can add in to a circuit are bulbs, switches, buzzers and motors.
Conductor	A conductor of electricity is a material that will allow electricity to flow through it.
Insulator	Materials that are electrical insulators do not allow electricity to flow through them.

1. For each appliance, please tick the appropriate box. The first one has been done for you.

Appliance	Battery-Powered	Battery or Mains Powered	Mains Powered	Non-electrical appliance
 saucepan				✓
 torch				
 microwave				
 potato peeler				
 washing machine				
 alarm clock				

Label the different parts of an electrical circuit below.



Keywords

cell motorswitch buzzer wires lamp/bulb

Sticky Learning.

Can you answer any of these questions in your

1. Look at the circuit diagram and circle the correct answers to say what you think will happen, and why.

	I think that the bulb <u>will / will not</u> light up. This is because the circuit is <u>complete / incomplete</u> .
	I think that the bulb <u>will / will not</u> light up. This is because the circuit is <u>complete / incomplete</u> .
	I think that the bulb <u>will / will not</u> light up. This is because the circuit is <u>complete / incomplete</u> .



Fancy a challenge? Electricity Quiz

Scan this and have a go at an Electricity quiz!



Year 4 Science

Electricity Teacher's Page.

Things pupils should already know:

Year 2

- That materials have different uses and different properties.
- Electricity can be used to create a source of light

What comes next? (Year 6)

- That common appliances run on electricity
- How to construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- To be able to investigate 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
- That a switch opens and closes a circuit and what is required to light a bulb in a simple series circuit
- To know that some materials are conductors and insulators, and know that metals are good conductors.

Key Working Scientifically skills:

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 in answering questions

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

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

Identifying differences, similarities or changes related to simple scientific ideas and processes

Using straightforward scientific evidence to answer questions or to support their findings

Electricity

Statutory requirements

Pupils should be taught to:

- 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.

Notes and guidance (non-statutory)

Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6.

Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity.

Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.