



# ELECTRICITY

YEAR 3/4 KNOWLEDGE ORGANISER



## What I will have learnt by the end of the unit

I can identify common appliances that run on electricity

I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers

I can identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a loop with a battery

I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit

I can recognise some common conductors and insulators, and associate metals with being good conductors

## What I should have already learnt

How to keep safe when using common electrical household items.

Electrical safety when out and about and within a school setting.

A basic introduction to electricity in KS1 before children progress to learning about simple electrical circuits in year 4

## Key Concepts

Biology  
Chemistry  
Physics  
Scientific enquiry  
Science for the future  
Vocabulary

## What I will have learnt at the end of the key stage

- I will be able to associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- I will be able to 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
- I will use recognised symbols when representing a simple circuit in a diagram

## Key Vocabulary

**Electricity:** A form of energy used for lighting, heating, making sound and making machines work.

**Electrical appliance:** A machine or device that runs on electricity.

**Mains:** The electricity supplied to households from power stations.

**Electrical circuit:** This consists of a cell or battery connected to a component using wires. It needs to be a complete circuit to work. cell and battery

**Cell:** A single unit and a battery is a collection of cells.

**Electrical component:** A part that combines with others to form a circuit. E.g. bulb, motor, buzzer switch Can be added to a circuit to turn a component on or off. It allows the electricity to flow or it stops it.

**Conductor:** Material that allows electricity to pass through.

**Insulator:** Material that does not allow electricity to pass through it.

## Key Skills I will learn/use

- 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 conductor
- Asking relevant questions and using different types of scientific enquiries to answer them.
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment.
- Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.

## Opportunities for teaching diversity, equality (including protected characteristics and expanding cultural capital)

**Get to meet a scientist! Explore people who use science in their jobs.** I'm a Scientist, Get me out of here! - A super-curricular science outreach education & engagement activity ([imascientist.org.uk](http://imascientist.org.uk)) Science for Everyone ([science4everyone.org](http://science4everyone.org))

### Skills I may use for other subjects

**Literacy-** I can use my literacy knowledge to write about my findings.

**Mathematics-** I can use my knowledge carry out simple tests and record my findings using diagrams and graphs.

**Recall & Remember ~** Add information to your knowledge mind map regularly, to help you reflect on, and remember what you have learnt throughout the unit. At the end of the unit, work in a small group to create a fun quiz on purple mash about forces for your friends to complete.



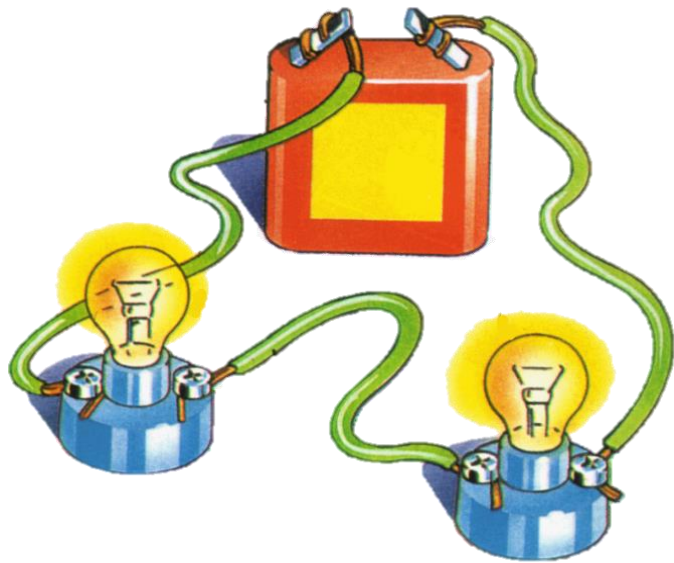


# ELECTRICITY

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## Key Knowledge



- Electricity is a type of energy.
- It is used to power lots of different things, including many items that we use in everyday life.
- Electricity can flow through wires and cables, and can be stored in batteries (sometimes called cells).
- Electricity can flow in simple series electrical circuits.
- Some materials conduct electricity, and others do not (insulators).

## Creation and Uses of Electricity



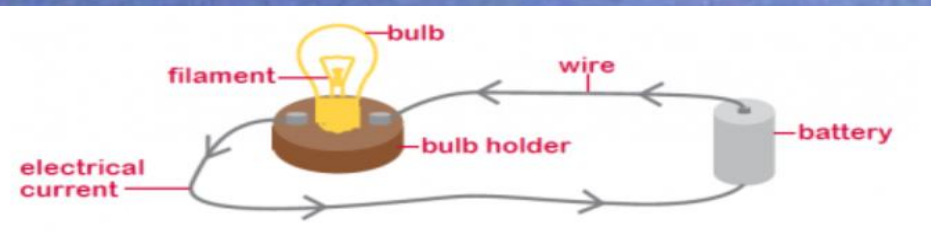
Electricity can be created in a number of different ways, for example:

- Burning fossil fuels (oil, gas, etc.) in power stations;
- Using solar power generated from the sun;
- Using wind power from wind turbines;
- Using water power (hydropower).

Electricity is used to power numerous household appliances, for example laptops, TVs, fridges, microwaves, toasters, ovens and lights/ lamps. Life would be very different without it!

## Simple Series Electric Circuits

This diagram shows a battery with wires connecting it to a battery (or cell).



## Electrical Safety



Electricity can be extremely dangerous if it is not used safely. It can cause burns, shocks, serious injury and (in extreme cases) even death.

There are many electrical dangers, both in the home and outdoors.

### Some Important Electrical Safety Tips

- Do not put fingers and other objects in an outlet;
- Never use anything with a cord or plug around water;
- Keep metal objects away from toasters;
- Stay away from power stations and power lines;
- Never pull a plug out by its cord;
- Never touch or climb trees near power lines;
- Go indoors when there is thunder and lightning.
- Look out for signs like the one on the left.



### Circuit

-A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow.

### Current

-A current is the electricity flowing through the circuit.

### Battery (Cell)

-A battery (or cell) is something in which electricity can be stored.

### Wire/Cable

-Wires and cables are thin flexible threads that transport electricity.

### Conductor/Insulator

-Conductors allow electricity to flow through freely. Insulators do not allow electricity to flow through freely.

## Conductors

Silver

Gold

Copper

Steel

Sea Water

## Insulators

Rubber

Glass

Oil

Diamond

Dry Wood