

Year 4 Unit Overview

States of Matter

Electricity

Living Things and their Habitats

Animals, Including Humans

Sound

Scientists



[Daniel Fahrenheit](#)
(Inventor of the thermometer)
[Dr Fangxian Fang](#)
(Earth scientist)



[Michael Faraday](#)
(Physicist)
[Hertha Ayrton](#)
(Electrical engineer and suffragette)



[Prem Singh Gill](#)
(Polar scientist)
[Gladys West](#)
(Mathematician/GPS)



[Ivan Pavlov](#)
(Physiologist)
[Charlotte Armah](#)
(nutritional biochemist - looking at the effect of diet on human health)



[Evelyn Glennie](#)
(Deaf percussionist)
[Karrie Keyes](#)
(Audio engineer)

Careers

Nanoscientist (studies incredibly small things such as atoms)
Science teacher (teaches others about science)

Electrical engineer (works with equipment that uses electricity)
Physicist (studies physics)

Conservationist (works for the protection and preservation of living things and the environment)
Ecologist (studies interactions between living things and their environments)

Orthodontist (a doctor who looks after people's teeth and gums)
Nutritionist (studies nutrition in food and how it affects our bodies)

Audiologist (studies sound and its properties)
Sound engineer (deals with sound for broadcasts or musical performances)

Working Scientifically

I'm taking accurate measurements using equipment like a nanoscientist.
I'm using scientific evidence to answer questions like a science teacher.

I'm performing comparative and fair tests like an electrical engineer.
I'm recording findings using diagrams, charts and tables like a physicist.

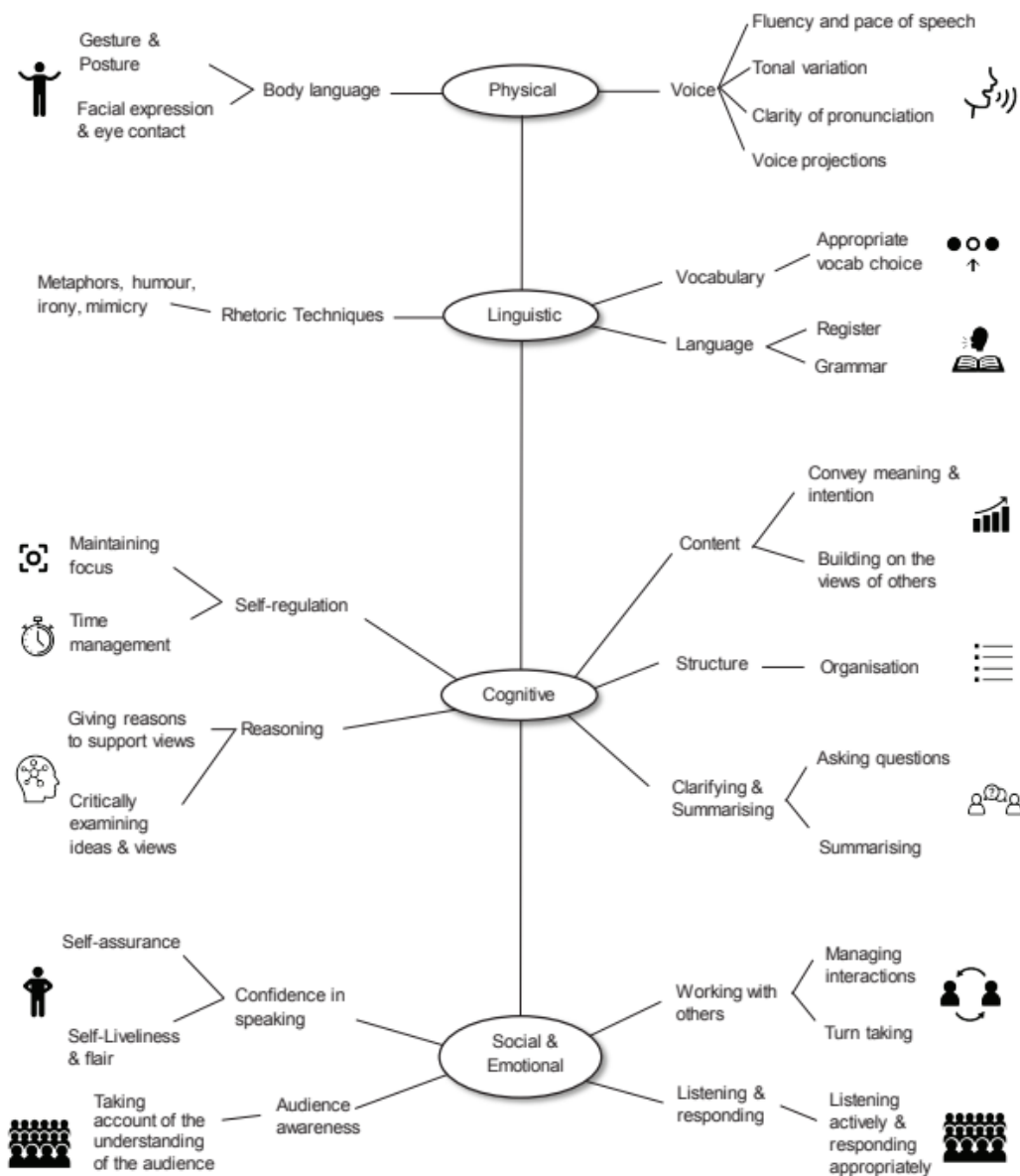
I'm gathering, recording and presenting data like an ecologist.
I'm presenting my findings using my Oracy skills like a conservationist.

I'm making systematic and careful observations like an orthodontist.
I'm using results to make predictions and draw conclusions like a nutritionist.

I'm identifying differences and similarities like an audiologist.
I'm using scientific enquiries to answer questions like a sound engineer.

Supporting Oracy Resources

Oracy Graphic Organiser



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Sentence Stems for giving feedback

Praise: What have they done well?

Be Specific

Give an example

Why was it good?

- Because you have...
- Your work has had the effect of...
- You have improved how...
- I notice that you...
- This means that...

- When you... it made me...
- Your use of... in order to...
- I enjoyed the part where...
- The part where you... has had the effect of...

Enhance: What do they need to do to improve?

Be specific

Give an example

Why will it enhance their learning?

Checking for Understanding	Reshaping and Extending Learning
<ul style="list-style-type: none"> • Why did you choose to...? • Can you explain how...? • Prove to me how you came to this conclusion by using... • What effect did ... have on ... 	<ul style="list-style-type: none"> • I've noticed that you haven't... • Can you prove...? • Could you have included...? • Where else could you use... in your learning? • In order to improve your learning, you need to...

Respond: Show that you understand

Read what you could have done better

Correct the mistake

Show how you now understand

- Thank you, I agree that...because...
- I can see why you've said that...
- I actually disagree with you because...
- I have now... the effect this has had is...

- Now that I've had time to reflect...
- I agree with your comment that... because...
- Now that you've pointed it out...
- You've helped me to understand...

Supporting Oracy Resources

Tiered Vocabulary Wall- A way to organise our words.

Tiered Vocabulary Walls are a way of organising words. The aim of using Tiered Vocabulary Walls is to increase the amount of Tier 2 and Tier 3 words which children hear and use themselves. Tier 2 and Tier 3 words make the most impact on our vocabulary and on our learning. These words need direct teaching in order for them to be understood and used.

Tier 3	<p><u>Subject specific words:</u></p> <p>These will be rare and will be heard within particular contexts or subject areas. These will need direct teaching, such as:</p> <p><i>estuary, alliteration, igneous...</i></p>
Tier 2	<p><u>Focus words:</u></p> <p>These will be common words that are found across subjects. These will need direct teaching, such as:</p> <p><i>contradict, circumstance, precede, retrospect...</i></p>
Tier 1	<p><u>Everyday words:</u></p> <p>These will be basic, everyday words which will be used from an early age. These will be used freely in speech, such as:</p> <p><i>warm, dog, tired, run, table, flower....</i></p>

For example, Tiered Vocabulary for weather could look like:

Tier 3: barometer, isobar, celsius, tsunami

Tier 2: predict, forecast, breeze, shower, pressure

Tier 1: sun, cloud, rain, cold, warm, wind



Talking like a Scientist Sentence Stems



- It is...because...
 - It will...because...
 - *How do you know (e.g. 'The porridge is hot')?*
- I think this...because...
 - I know this, so I think...
 - This will happen because...
 - *What do you think?*
 - *What will happen if...?*
- I know that... Therefore, I know that...
 - Due to the fact that..., I know that...will happen.
 - Maybe it's because...
 - It is true that...
 - Having analysed..., I believe that...
 - I can prove how I know this because...
- Can we prove that...?
 - In conclusion, I have found that...
 - I would like to prove / disprove...
 - Perhaps the reason is ...
 - Based on the evidence I have been presented with, I conclude...
 - Taking everything into account...
 - Having pondered...
 - Given this, it is likely that...
 - *If we accept this hypothesis, what else will be true?*

Oracy in action video library:

- *[Talk Tactics](#)
- *[Discussion in EYFS](#)
- *[Concept Cartoon](#)
- *[Whole class talk detectives](#)
- *[Talk Tokens](#)
- *[New Vocabulary](#)
- *[Silent Summariser](#)
- *[Harkness Discussion](#)
- *[Odd One Out](#)

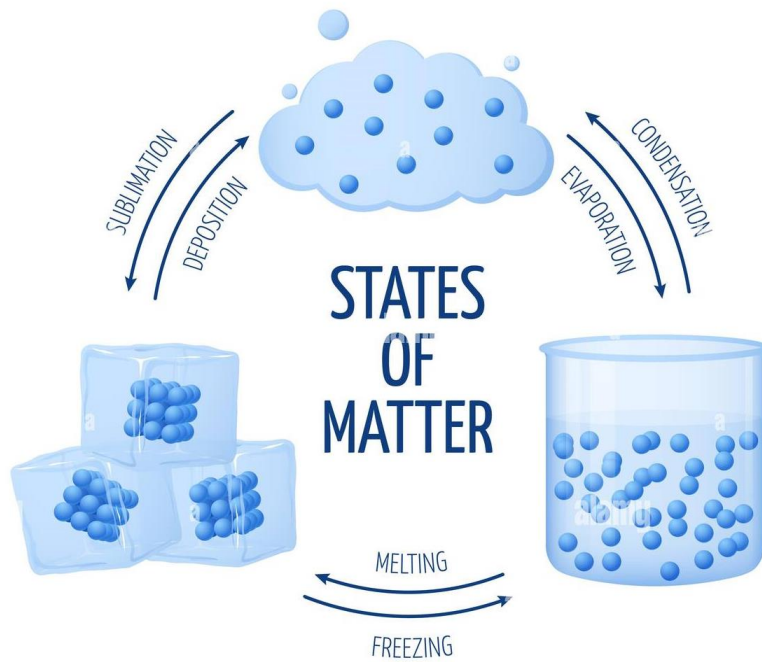
States of Matter

Knowledge Organiser

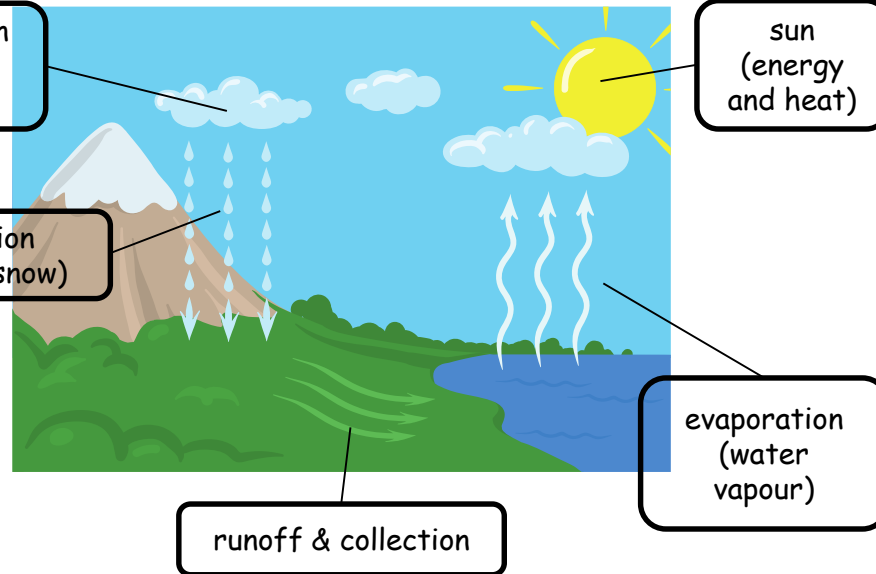
Unit: States of Matter

A 'mixture' is something that is physically joined together but can be separated again.

Mixtures can be separated in so many ways - such as evaporation, distillation, filtering and absorption.



The Water Cycle



1

• Can I compare and group solids, liquids and gases?

2

• Can I investigate the effect of temperature on changing state?

3

• Can I understand dissolving and diluting?

4

• Can I explore evaporation and condensation?

5

• Can I understand the water cycle?

6

• Can I describe freezing and melting?

Key Vocabulary

Key Word	Meaning
water cycle	The processes that water takes between the earth's oceans, land and atmosphere.
molecule	A group of atoms bonded together that can take part in a chemical reaction.
solute	Something which is dissolved in a solution.
solvent	The ability to dissolve other substances.
evaporation	The process of liquid turning to vapour.
water vapour	The form water takes when it evaporates into a gas in the air.
condensation	The conversion of a vapour or gas to a liquid, often collects as droplets on a cold surface.
distillation	The action of purifying a liquid by heating and cooling.

Dissolving

- The item being dissolved is the solute.
- The substance dissolving it is called the solvent.
- When the solvent can dissolve no more of the solute, it is called 'saturation'

Diluting

- This process reduces the concentration of a solute in a solution.
- Takes place by adding more of the solvent to the solute.
- A good example of this is adding more water to orange squash.

Unit	Year 4: States of Matter	
National Curriculum	Pupils should be taught to: <ul style="list-style-type: none"> • Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	
Prior Learning		Future Learning
<p>Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)</p> <p>Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)</p>		<p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials)</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. (Y5 - Properties and changes of materials)</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. (Y5 - Properties and changes of materials)</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials)</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes. (Y5 - Properties and changes of materials)</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. (Y5 - Properties and changes of materials)</p>
Key Learning		Key Vocabulary
<p>A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid.</p> <p>Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling.</p> <p>Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.</p>		solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle
Common Misconceptions	Some children may think: <ul style="list-style-type: none"> • 'solid' is another word for hard or opaque • solids are hard and cannot break or change shape easily and are often in one piece • substances made of very small particles like sugar or sand cannot be solids • particles in liquids are further apart than in solids and they take up more space • when air is pumped into balloons, they become lighter • water in different forms - steam, water, ice - are all different substances • all liquids boil at the same temperature as water (100 degrees) • melting, as a change of state, is the same as dissolving • steam is visible water vapour (only the condensing water droplets can be seen) 	

Year 4 States of Matter

Lesson Question	Skills	Knowledge	Lesson Overview	Summative Assessment Questions	Key Vocabulary
Can I compare and group solids, liquids and gases?	Identifying differences, similarities or changes related to simple scientific ideas and processes	Compare and group materials together, according to whether they are solids, liquids or gases	Create your own model which shows how water exists in three different states of matter.		state of matter, particle, volume, matter, bond
Can I investigate the effect temperature has on changing state?	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. States of matter (non-statutory) - observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying	Investigate how quickly a material dries at different temperatures		temperature, degrees Celsius, melting point, boiling point, thermometer
Can I understand diluting and dissolving?	Identifying difference, similarities or changes related to simple scientific ideas and processes	Compare and group materials together, according to whether they are a solids, liquids or gases.	Setting up simple practical enquiries, comparative and fair tests. Explore how to make the best bubble mixture by diluting substances.		dissolve, dilute, soluble, solvent, solute
Can I understand evaporation and condensation?	Reporting on findings from enquiries, including oral and written explanations, displays, or presentations of results and conclusions.	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Set up an experiment to see the rates of evaporation of different substances.		evaporation, condensation, absorb, heat, water vapour
Can I understand the water cycle?	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Water cycle collage.		water cycle, precipitation, transpiration, surface run off, groundwater
Can I describe freezing and melting?	To describe and explain findings from an evaporation investigation, and grouping and classifying a variety of different materials.	Observe that some materials change state when the are heated or cooled.	What temperature does wax freeze at?		melting, freezing, sublimation, deposition, reversible

Electricity

Oracy Outcome:

Year Group	Oracy Skills – Learning <i>to</i> talk	Oracy Skills – Learning <i>through</i> talk	Oracy Outcome			
	Physical, Linguistic, Cognitive, Social & Emotional	Subject specific skills	Purpose	Audience	Outcome (link to topic)	Resources
4 - Electricity	<p>Physical - To consider movement when addressing an audience.</p> <p>Physical - To consider how tone, volume and pace influence meaning.</p> <p>Linguistic - To carefully consider the words and phrasing they use to express their ideas and how this supports the purpose of talk.</p> <p>Social and Emotional - To develop an awareness of audience.</p>	<p>Cognitive - To be able to give supporting evidence e.g. explaining what would happen if a component was removed.</p>	To give instructions	Year 5 - recorded or in person Groups of 3	How to... make a circuit	Vocabulary bullseye, Talk Detectives, Story maps, Concept cartoons Always, Sometimes, Never, Back-to-back

The Oracy Framework

Here are some things to think about when you are using your oracy skills:



Physical

Voice:

- Are you speaking **clearly**, with **expression**?
- Are you adapting the **tone**, **pace** and **volume** of your voice for different situations?



Body:

Do your **body language** and **facial expressions** match the message you are trying to convey?



Linguistic

Vocabulary:

How are you **choosing** what **vocabulary** to use and **tailoring** it to your audience?

Language:

Are you matching your **language** to the **situation**?



Rhetorical techniques:

Are you using a range of **persuasive techniques**?



Cognitive

Content:

Are you being **clear** about your main points as well as **building on** the thoughts of others?



Structure:

How have you **organised** your talk so that it presents a **clear argument** or **narrative**?

Making things clear:

- Are you asking questions to **clarify**, **probe** and **challenge**?
- Are you **summarising** the main points in a succinct way?

Reasons:

Are you **responding** to what is being said and providing **evidence** for the points you are making?



Social & Emotional

Working with others:

Are you aware of the **group dynamics** and actively **inviting** others to share their opinions?

Listening:

Are you **actively listening** and **responding appropriately**?

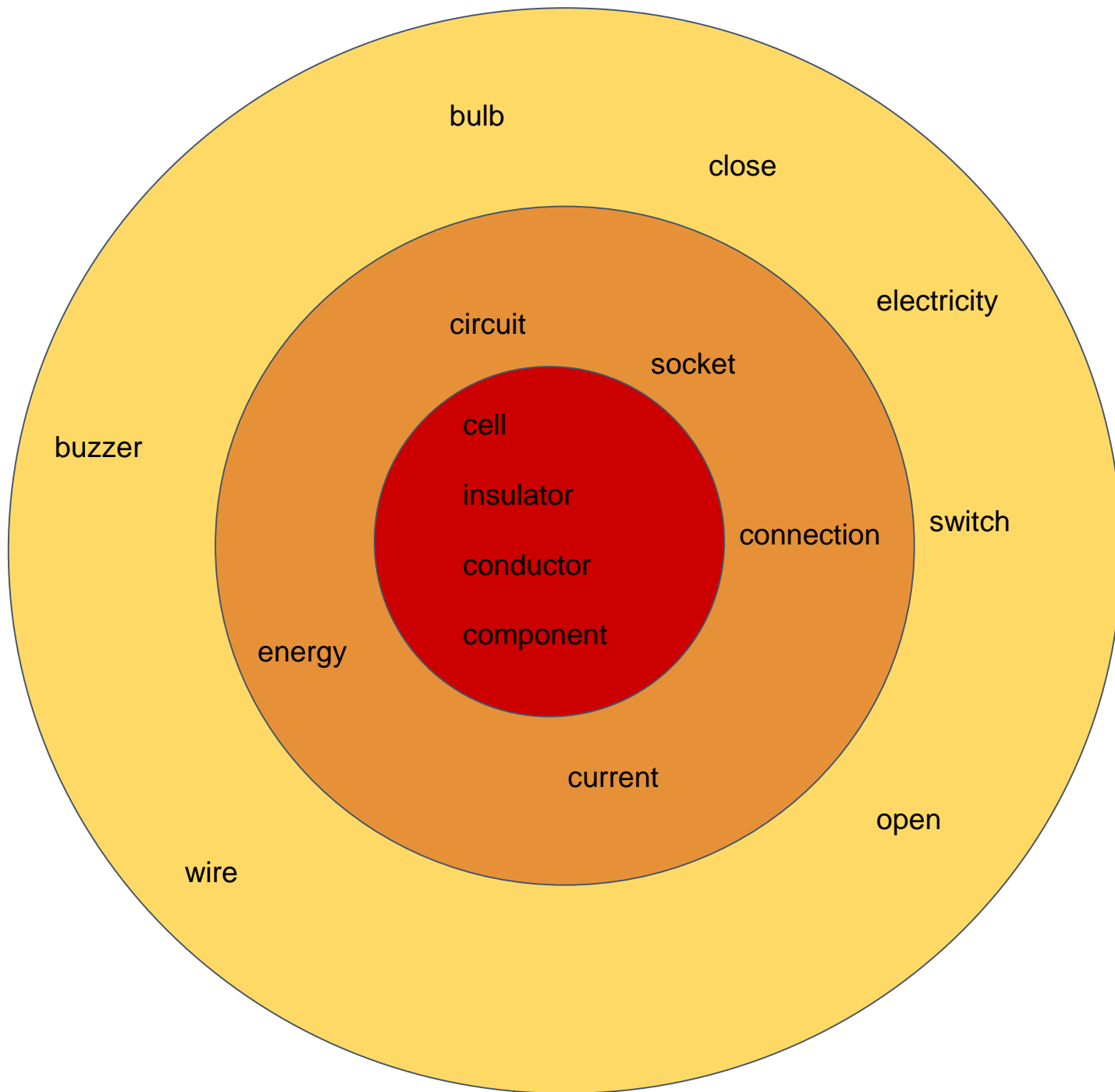
Confidence:

How are you showing that you're **confident** as well as being **respectful** to others?



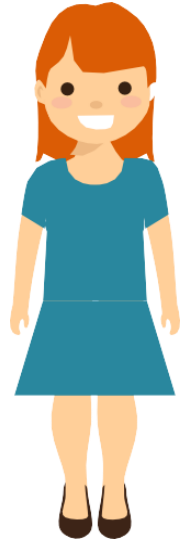
Audience:

Are you thinking about your **audience** and **adapting** your speech accordingly?



	Tally	Total
1 point words		
3 point words		
5 point words		
	Overall total =	

Concept Cartoon



Erika

You just need a cell and a bulb.

Lots and lots of wires.



Karl

To make a complete circuit work, you need...



Tamana

One wire, one cell and one buzzer.

Two wires and one cell.



Tom

Knowledge Organiser Unit: Electricity

Key Question 1

• Can I identify when a lamp will light in a simple series circuit?

Key Question 2

• How is electricity transported?

Key Question 3

• Can I understand the difference between a series and parallel circuit?

Key Question 4

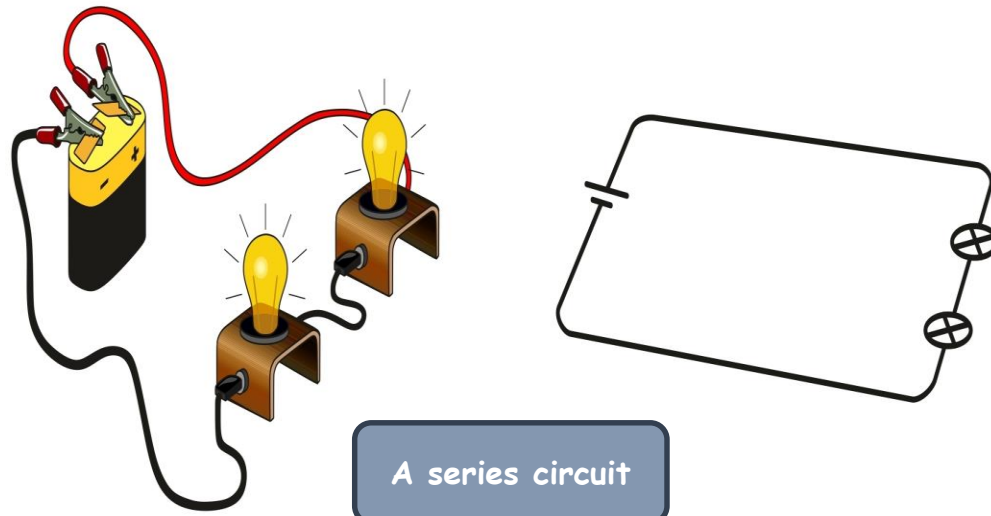
• Can I explain how to recognise electrical conductors and insulators?

Key Question 5

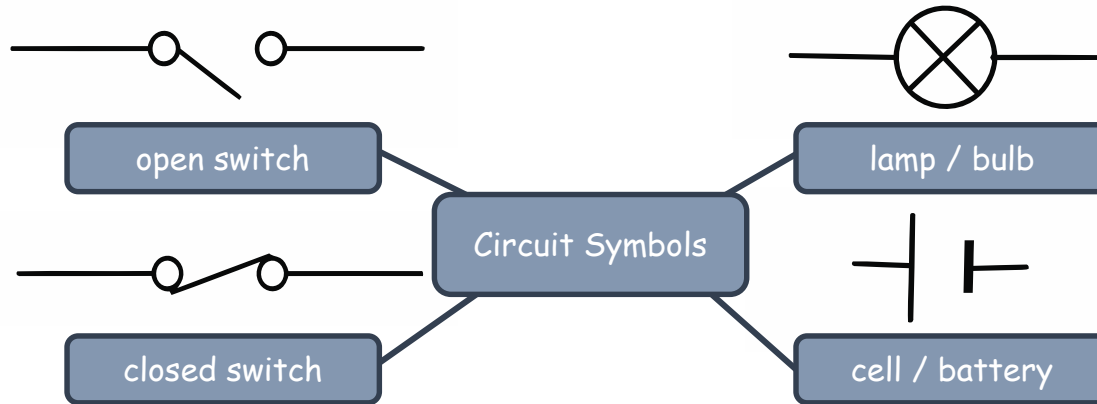
• Can I describe the basic parts of a circuit?

Key Question 6

• How do you work safely with electricity?



A series circuit



All metals are good conductors of electricity and materials like rubber are good insulators.

It is very important to be safe with electricity. Electricians are trained to be safe with electrical circuits and equipment.

Key Vocabulary

Key Word	Meaning
series circuit	A looped circuit where the electricity flows from the positive to negative terminal of the battery.
circuit diagram	Electrical components shown in a picture by using standard symbols.
parallel circuit	A circuit with two or more pathways for the current to flow through.
conductor	Materials which allow electricity to flow through them with ease.
insulator	Materials that do not allow electricity to pass through them with ease.
loop	A complete circuit.
switch	A toggle which is changed by someone as way of controlling an electrical circuit or system.
resistance	A measure of how much an object opposes the flow of electrons.

- We can conserve energy by:
- Turning off electrical devices
 - Turning lights off
 - Using renewable sources such as solar and wind power
 - Using energy-saving lightbulbs

Unit	Year 4: Electricity	
National Curriculum	<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. 	
Prior Learning		Future Learning
Explore how things work. (Nursery - Electricity)		<p>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)</p> <p>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)</p> <p>Use recognised symbols when representing a simple circuit in a diagram. (Y6 - Electricity)</p>
Key Learning		Key Vocabulary
<p>Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery 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.</p> <p>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>		<p>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</p> <p>N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6</p>
Common Misconceptions	<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. 	

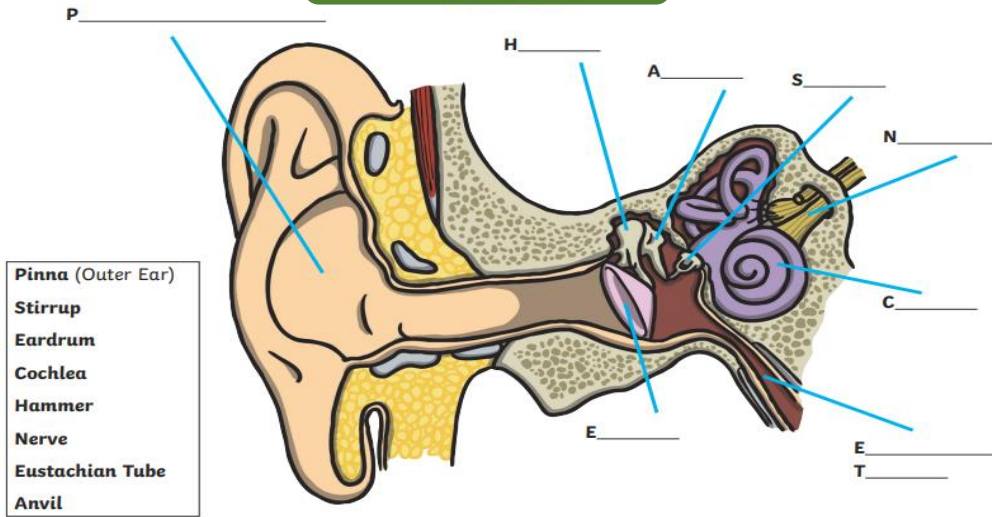
Year 4 Electricity

Lesson Question	Skills	Knowledge	Lesson Overview	Summative Assessment Questions	Key Vocabulary
Can I identify when a lamp will light in a simple series circuit?	Identifying differences and similarities or changes related to scientific ideas and processes.	Construct a simple series electric circuit, identifying and naming the basic parts, including cells wires, bulbs, switches, and bulbs.	Build a circuit and draw a diagram of it.		open circuit, closed circuit, switch, component, circuit diagram
How is electricity transported?	Identifying differences, similarities or changes related to simple scientific ideas and processes.	Identify common appliances that run on electricity	Make your own doorbell.		national grid, switch, wind turbine, electrons, cable
Can I understand the difference between a series and parallel circuit?	Identifying differences and similarities or changes related to scientific ideas and processes.	Construct a simple series electric circuit, identifying and naming the basic parts, including cells wires, bulbs, switches and bulbs. This lessons goes beyond the national curriculum which only asks you to explore series circuits.	Design and make a light spinner card and test it out with series and parallel circuits.		parallel circuit, series circuit, current, continuous, represent
Can I explain how to recognise electrical conductors and insulators?	Identifying differences and similarities or changes related to scientific ideas and processes.	Recognise some common conductors and insulators and associate metals with being good conductors.	Which materials are conductors and which ones are insulators. Predict and then test.		conductor, insulator, resistance, electrical shock, short circuit
Can I describe the basic parts of a circuit?	Identifying differences and similarities or changes related to scientific ideas and processes.	Identify common appliances which run on electricity. Construct a simple series electric circuit, identifying and naming the basic parts, including cells wires, bulbs, switches, and buzzers.	Create your own electrical circuit, powered by a lemon!		electric circuit, wire, electrical appliance, bulb, battery
How do you work safely with electricity?	Identifying differences and similarities or changes related to scientific ideas and processes.	Pupils should be taught about precautions for working safely with electricity.	Create your own health and safety booklet which explains how to use electrical appliances correctly.		electrician, electric shock, precaution, repair, electrical socket

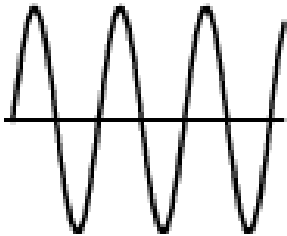
Sound

Knowledge Organiser - Unit: Sound

The Human Ear

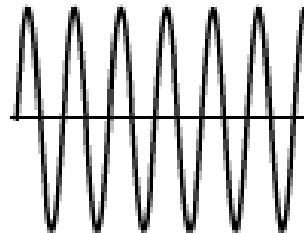


low pitch sound



- The sound waves are wider apart.
- Has a lower frequency in hertz (Hz)
- The sound wave moves slower.
- On a musical instrument, a thicker string will produce a lower sound.

high pitch sound



- The sound waves are closer together.
- Has a higher frequency in hertz (Hz)
- The sound wave moves quicker.
- On a musical instrument, a thinner string will produce a higher sound.

Key Question 1 • How do sounds travel?

Key Question 2 • What causes sound?

Key Question 3 • Can I compare the sound and the speed of light?

Key Question 4 • Can I compare sounds in solids, liquids and gases?

Key Question 5 • Can I describe sounds?

Key Question 6 • How can I protect my ears from sounds?



Protecting your ears

- If a sound reaches 85 decibels (dB) or stronger, it can permanently damage your hearing.
- Your ear drum can get perforated, or burst, if you don't protect your ears.
- Ear defenders are used by workmen and those who work in noisy environments to protect their ears from the sound.

Key Vocabulary

Key Word	Meaning
vibration	A movement back and forth to create a sound.
speed of sound	The distance travelled per unit volume by a sound wave.
soundproof	Something such a material that prevents the passage of sound through it.
sound wave	A form that sound takes as it moves through air, water etc. Recorded on a graph.
frequency	The number of cycles per second that a sound oscillates, recorded in Hertz (hz).
decibel	A unit measurement given to the loudness or intensity of a sound.
eardrum	The part of the ear that vibrates when receiving sounds.
pitch	The quality related who whether sounds are 'high' or 'low.'

Unit	Year 4: Sound	
National Curriculum	Pupils should be taught to: <ul style="list-style-type: none"> • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases. 	
Prior Learning		Future Learning
<ul style="list-style-type: none"> • Explore how things work. (Nursery - Sound) • Describe what they see, hear and feel whilst outside. (Reception - Sound) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) 		<ul style="list-style-type: none"> • Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel - superposition. (KS3) • Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. (KS3) • Sound needs a medium to travel, the speed of sound in air, in water, in solids. (KS3) • Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. (KS3) • Auditory range of humans and animals. (KS3) • Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. (KS3) • Waves transferring information for conversion to electrical signals by microphone. (KS3)
Key Learning		Key Vocabulary
<p>A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.</p> <p>The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively.</p> <p>Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.</p>		Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation
Common Misconceptions	Some children may think: <ul style="list-style-type: none"> • sound is only heard by the listener • sound only travels in one direction from the source • sound can't travel through solids and liquids • high sounds are loud and low sounds are quiet. 	

Unit	Year 4: Sound					
National curriculum	Pupils should be taught:- <ul style="list-style-type: none"> Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases. 					
When	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
LQ	How do sounds travel?	What causes sound?	Can I compare the speed of sound and the speed of light?	Can I compare sounds in solids, liquids and gases?	Can I describe different sounds?	How can I protect my ears from sounds?
vocab	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation					
Skills	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including data loggers.	Identifying differences, similarities or changes related to simple scientific ideas and processes; Setting up simple practical enquiries, comparative and fair tests	Use knowledge to explain different phenomena	Using straightforward evidence to answer questions or to support their findings.	Reporting on findings from enquiries, including oral and written explanation	Using results to draw simple conclusions.
Knowledge	Recognise that sounds get fainter as the distance from the source increases.	Identify how sounds are made, associating some of them with something vibrating.	Find patterns between the pitch of a sound and features of the object that produced it.	Recognise that vibrations from sounds travel through a medium to the ear.	Find patterns between pitch of sound and features of the object that produced it.	Find patterns between volume of a sound and the strength of the vibrations that produced it.
Suggested Activity	Setting up simple practical enquiries, comparative and fair tests. Sound muffler challenge!	Exploring sound vibration!	Explore light & sound phenomena	Observe sounds in solids, liquids and gases.	Create a sound museum	Which materials are good at insulating sounds?
Scientist / Inventor						
Assessment + Questions	sound wave, echo, pinna, diffraction, fade	loudspeaker, voice box, sound, source, vibration	supersonic, Concorde, speed of sound, thunder, lightning	medium, vacuum, transmit, clarity, particles	low-pitched, high-pitched, volume, loud, quiet	ear defence, baffling, absorb, muffled, sensitivity

Living Things and their Habitats







Knowledge Organiser

Unit: Living Things and their Habitats

In 2018, scientists discovered 230 new species of animals and plants on earth.

A habitat is a natural environment for any type of living organism.

- 1 Can I identify a variety of habitats and understand why organisms live in different habitats?
- 2 How do scientists classify animals?
- 3 Can I identify animals into specific groups according to their characteristics?
- 4 Can I use a classification key to identify animals?
- 5 Can I identify and classify a variety of British plants?
- 6 Can I explore the human impact on habitats and environments?

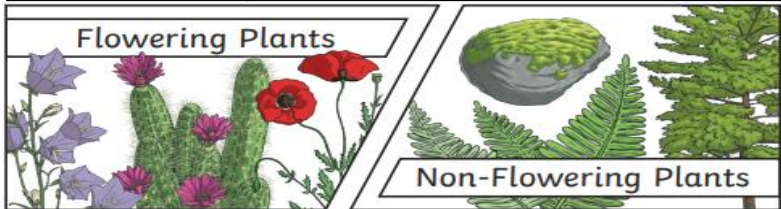
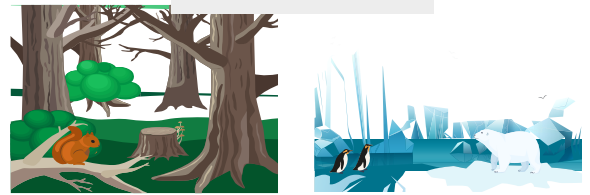
Type	Food	Body	Blood
Mammal 	Can be carnivorous, omnivorous or herbivorous	<ul style="list-style-type: none"> • Hair and fur • Four-chambered hearts • Females give milk • Have teeth • Vertebrates 	Warm-Blooded
Insect 	Can be carnivorous or herbivorous	<ul style="list-style-type: none"> • Made up of a head, thorax and abdomen • Six legs • Invertebrates 	Cold-Blooded
Bird 	Can be carnivorous, omnivorous or herbivorous	<ul style="list-style-type: none"> • Feathers • Wings • Beaks • Lays eggs • Vertebrates 	Warm-Blooded
Fish 	Mostly carnivorous	<ul style="list-style-type: none"> • Breathe with gills • Scales • Fins • Can swim • Most are vertebrates 	Cold-Blooded
Amphibian 	Can be carnivorous or herbivorous	<ul style="list-style-type: none"> • Live in water or land • Can breathe through gills or lungs • Vertebrates 	Cold-Blooded
Reptile 	Can be carnivores or omnivorous	<ul style="list-style-type: none"> • Most lay eggs • Has scales • Live in water or land • Vertebrates 	Cold-Blooded

Key Vocabulary

Key Word	Meaning
classify	To arrange or group things into categories depending on characteristics.
vertebrate	An animal with a backbone.
invertebrate	An animal without a backbone.
cold-blooded	An animal whose body temperature varies with the environment they are in, i.e. fish.
warm-blooded	Animals that maintain a regular body temperature
characteristics	The distinguishing features or qualities that are specific to a species.
habitat	The specific area or place in which particular animals or plants may live.
life processes	The things living things do to stay alive.



Habitats



Unit	Year 4: Living Things and their Habitats	
National Curriculum	Pupils should be taught to: <ul style="list-style-type: none"> • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Recognise that environments can change and that this can sometimes pose dangers to living things. 	
Prior Learning		Future Learning
<ul style="list-style-type: none"> • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) • Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans) • Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats) 		<ul style="list-style-type: none"> • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) • Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. (Y6 - Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
Key Learning		Key Vocabulary
<p>Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things.</p> <p>Living things live in a habitat which provides an environment to which they are suited (Year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering). These environments also change with the seasons; different living things can be found in a habitat at different times of the year.</p>		Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate
Common Misconceptions	Some children may think: <ul style="list-style-type: none"> • the death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain • there is always plenty of food for wild animals • animals are only land-living creatures • animals and plants can adapt to their habitats, however they change • all changes to habitats are negative. 	

Year 4 Living Things and their Habitats

Lesson Question	Skills	Knowledge	Lesson Overview	Summative Assessment Questions	Key Vocabulary
Can I identify a variety of habitats and understand why organisms live in different habitats? (recapping Year 2 learning)	Asking questions	I can identify that most living things live in habitats to which they are suited. I can describe how different habitats provide for the basic needs of different organisms.	Asking relevant questions and using different types of scientific enquiries to answer them.	Do children know what a habitat is? Can children identify a variety of habitats? Do children know that animals live in habitats that are suited to their needs?	organism habitats basic needs
How do scientists classify animals?	Making systematic and careful observations.	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Classifying into groups. Look at varied animals and decide which groups you can classify them into.	Can children identify similarities and differences between similar organisms? Can children group animals and explain the criteria that has been used to sort them? Can children make careful observations to identify the characteristics of different organisms?	classify characteristics species vertebrate invertebrate
Can I classify animals into specific groups according to their characteristics?	Identifying differences, similarities or changes related to simple scientific ideas and processes	Recognise that living things can be grouped in a variety of ways.	Children to use the Animal Classification Key to sort the animals into the correct group.	Do children know that animals can be categorised into broad groups according to their characteristics? Can children use a classification key to help them identify which group an animal belongs to? Can children identify a variety of animals that are vertebrates, invertebrates, mammals, amphibians, insects, reptiles, fish and birds?	carnivore herbivore omnivore warm-blooded cold-blooded
Can I use a classification key to identify animals?	Grouping and classifying.	I can explore and use a classification key to group, identify and name a variety of living things in the local and wider environment.	Provide children with the British Animals Classification Key. Children to use the key to identify the animals on worksheet.	Can children use a classification key to identify unfamiliar animals? Can children use close observations to identify an animal's characteristics? Can children create their own classification keys to help identify an animal?	
Can I identify and classify a variety of British plants?	Asking relevant questions and using different types of scientific enquiries to answer them.	Explore and use classification keys to help them group, identify and name a variety of living things in their local and wider environment.	Children to develop knowledge on how they could organise plants into groups. Show children some of the ways plants have been grouped and ask them to identify how they have been classified. How can we find out what a plant is if we are not sure?	Can children group a variety of plants according to their characteristics? Can children use a classification key to identify plants? Can children use other sources to help them identify a variety of local plants?	flowering non-flowering deforestation nature reserve
Can I explore the human impact on habitats and environments	Use secondary sources to find out about human impact, both positive and negative, on environments	I can recognise that environments can change and that this can sometimes pose a danger to living things.	Children to list as many examples as they can to show both the positive and negative effects humans can have on environments and habitats. Children to discuss what they can do to help support and sustain their local environment.	Do children know how one change in a habitat can affect all the organisms within that environment? Can children list positive ways in which humans can impact the environment? Can children list negative ways in which humans can impact the environment?	environment impact positive negative

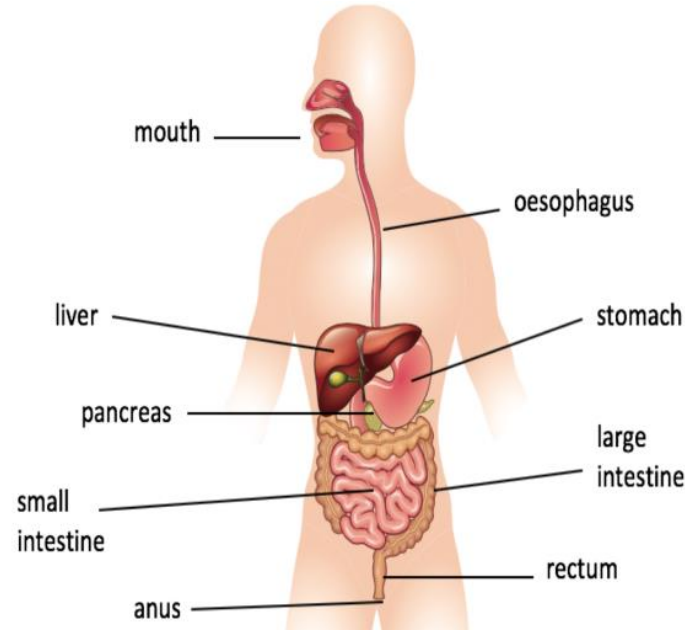
Animals, Including
Humans

Knowledge Organiser
Unit: Animals, Including Humans

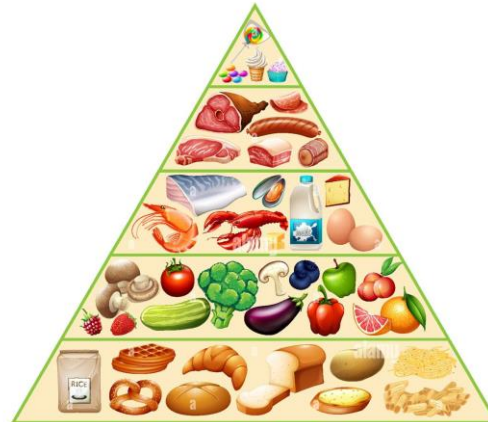
Key Vocabulary

Key Word	Meaning
salivary gland	A gland which produces saliva (spit) to help you digest your food.
oesophagus	A muscular tube connecting the throat and the stomach.
intestines	Including the large and small intestine, these are the tubes which pass your food from stomach to anus and help sort food and waste.
food pyramid	A graphic which outlines different food and healthy eating.
nutrient	A substance that offers nourishment to the body. We need these to be healthy.
vitamin	A group of compounds which are essential for healthy growth, they are found in food.
digest	To break down food within the body.
decomposer	An organism that breaks down organic material.

The Digestive System



The Food Pyramid



Our small intestine measures around 6 metres long if you stretched it out! Hardly 'small' is it?

- 1 Can I understand the function of the taste buds and salivary glands?
- 2 Can I describe the functions of different types of teeth?
- 3 Can I explain what happens to food from the point it enters your mouth and exits your body?
- 4 What is the importance of the food pyramid and a balanced diet?
- 5 Can I describe vitamins and minerals and the effects a lack of these have on us?
- 6 Can I understand the difference between producers, consumers and decomposers?

Fun Food Facts!

- Most of our protein comes from meat, fish, eggs and nuts.
- Fruit and vegetables are full of the vitamins we need to be healthy.
- A food chain is vital for nature to survive.
- We are 'consumers' as we eat food to make the energy we need.
- In the UK, 1.9 million tonnes of food is wasted each year!

The average adult human produces about 160kg of poo in a year!

Unit	Year 4: Animals, Including Humans	
National Curriculum	Pupils should be taught to: <ul style="list-style-type: none"> • Describe the simple functions of the basic parts of the digestive system in humans. • Identify the different types of teeth in humans and their simple functions. • Construct and interpret a variety of food chains, identifying producers, predators and prey. 	
Prior Learning		Future Learning
Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. (Y3 - Animals, including humans)		Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. (Y6 - Animals, including humans) Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans) Describe the ways in which nutrients and water are transported within animals, including humans. (Y6 - Animals, including humans)
Key Learning		Key Vocabulary
Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet. Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).		Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain
Common Misconceptions	Some children may think: <ul style="list-style-type: none"> • arrows in a food chains mean 'eats' • the death of one of the parts of a food chain or web has no, or limited, consequences on the rest of the chain • there is always plenty of food for wild animals • your stomach is where your belly button is • food is digested only in the stomach • when you have a meal, your food goes down one tube and your drink down another • the food you eat becomes "poo" and the drink becomes "wee". 	

Year 4 Animals, Including Humans - Food and Digestion

Lesson Question	Skills	Knowledge	Lesson Overview	Summative Assessment Questions	Key Vocabulary
Can I understand the function of the taste buds and salivary glands?	Gathering and recording data in a variety of ways to help in answering questions.	Describe the basic functions of the main parts of the digestive system in humans.	Juicy Jelly's! Using the blindfold can you identify the various flavours of sweets?		saliva, salivary glands, taste buds, digest, bitter
Can I describe the functions of different types of teeth?	Group and classifying things, conducting a comparative and fair test	Identify the different teeth in humans and their simple functions.	Design an experiment that explores how different substances stain the surface of our teeth.		incisors, canines, chew, molars, dentist
Can I explain what happens to food from the point it enters your mouth and exits your body?	Setting up practical enquiries	Describe the basic functions of the main parts of the digestive system in humans Animals, including humans (non-statutory) - be introduced to the main body parts associated with the digestive system, for example: mouth, tongue, teeth, oesophagus, stomach, and small and large intestine.	Use craft materials to make a model of the digestive system! Get creative!		small intestine, large intestine, stomach, appendix, nutrient
What is the importance of the food pyramid and a balanced diet?	Asking relevant questions	Identify that animals, including humans, need the right type and amount of nutrition, and that they cannot make their own food, they get nutrition from what they eat.	Create your own food pyramid which shows your diet		food pyramid, natural sugar, dairy product, meat, fruit and vegetables
Can I describe vitamins and minerals and the effects a lack of these have on us?	Asking relevant questions.	Identify that animals, including humans, need the right type and amount of nutrition, and that they cannot make their own food, they get nutrition from what they eat.	Help people's health and wellbeing by giving them advice about the vitamins and minerals in food.		vitamin A, vitamin B, vitamin C, vitamin D, mineral
Can I understand the difference between producers, consumers and decomposers?	Identifying differences, similarities or changes related to simple scientific ideas and processes	Construct and interpret a variety of food chains, identifying producers, predators and prey	Investigate three different habitats, and make a food chain pyramid to show the producers, herbivores and carnivores.	Choral Response Questions/ Phrase Suggestions A food chain consists of... A producer is the part of the food chain which... A consumer is part of the food chain which... A decomposer is...	producer, consumer, decomposer, wheat, soda bread