




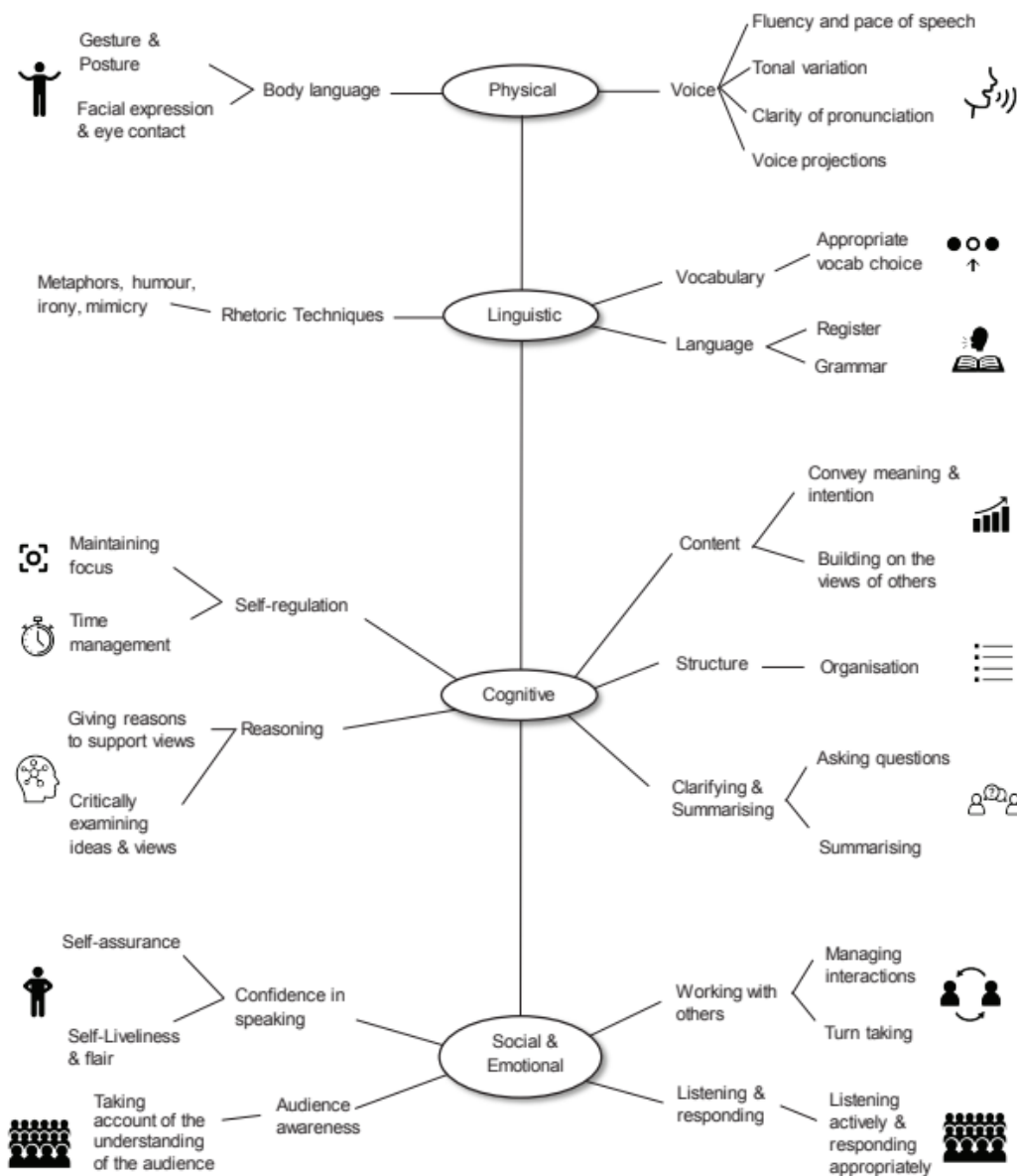


Year 3 Unit Overview

Rocks	Light	Plants	Animals, Including Humans	Forces and Magnets
Scientists				
 <p><u>Mary Anning</u> (Fossilist) <u>Christopher Jackson</u> (geologist)</p>	 <p><u>Ibn al-Haytham</u> (Mathematician and astronomer) <u>Patricia Bath</u> (Ophthalmologist and inventor)</p>	 <p><u>Ahmed Mumin Warfa</u> (Somali Botanist) <u>Maria Sibylla Merian</u> (1647-1717) (Documented the relationship between plants and insects)</p>	 <p><u>Willhelm Röntgen</u> (Invented the X-Ray) Zubair Haleem (Academy physio at Arsenal)</p>	 <p><u>William Gilbert</u> (Magnetism and electricity) <u>Jyoti Sehdev</u> (Senior civil engineer)</p>
Careers				
<p>Geologist (studies the Earth and what it is made of, including rocks) Volcanologist (studies volcanoes)</p>	<p>Astronomer (studies space) Optician (a doctor specialising in vision and eye health)</p>	<p>Horticulturist (an expert in garden cultivation and management) Irrigation engineer (creates and develops water systems)</p>	<p>Physiologist (a scientist who studies how plants and animals function) Dietician (develops nutrition advice to improve people's diets)</p>	<p>Architect (designs buildings) Seismologist (studies earthquakes)</p>
Working Scientifically				
<p>I'm performing comparative and fair tests like a geologist. I'm using scientific evidence to answer questions like a volcanologist.</p>	<p>I'm identifying differences and similarities like an astronomer. I'm presenting my findings using my oracy skills like an optician.</p>	<p>I'm taking accurate measurements using equipment like a horticulturist. I'm using scientific enquiries to answer questions like an irrigation engineer.</p>	<p>I'm making systematic and careful observations like a physiologist. I'm using results to make predictions and draw conclusions like a dietician.</p>	<p>I'm recording findings using diagrams, charts and tables like an architect. I'm gathering, recording and presenting data like a seismologist.</p>

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?*



Rocks

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
3 - Rocks	<p>Physical - To consider position and posture when addressing an audience.</p> <p>Physical - To experiment with adjusting tone, volume and pace for different audiences.</p> <p>Social and Emotional - To speak with confidence in front of an audience.</p>	<p>Linguistic - To use specialist vocabulary.</p> <p>Linguistic - To make precise language choices e.g. sedimentary, erosion, weathering.</p>	To explain and inform	<p>Recorded – for a younger audience</p> <p>Groups of 4</p>	60 second video – How do rocks become soil?	Which does not belong?, Consensus Circle, Vocabulary bullseye, Talk Detectives, Story map.

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?

Which one does not belong? – Year 3

A)

Brick

B)

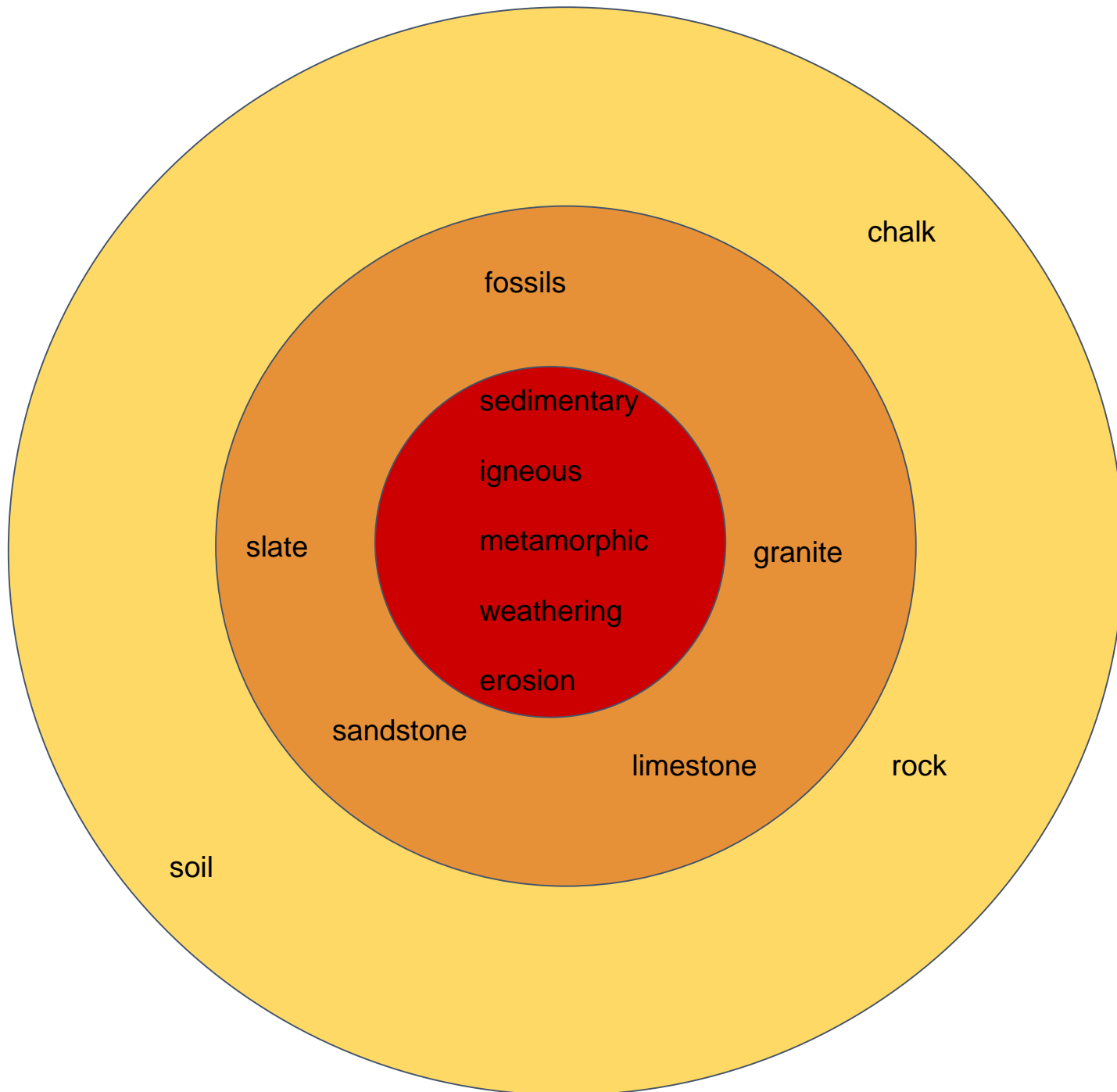
Chalk

C)

Limestone

D)

Slate roof



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

Always, Sometimes, Never

Rocks sink.

Knowledge Organiser

Unit: Rocks

Key Question 1

• How are mountains formed?

Key Question 2

• Can I recognise the differences between igneous, sedimentary and metamorphic rock?

Key Question 3

• Can I understand what a fossil is?

Key Question 4

• What is soil made of?

Key Question 5

• Can I identify common rocks?

Weathering

A good way to discover different types of weathering is by a trip to a graveyard.

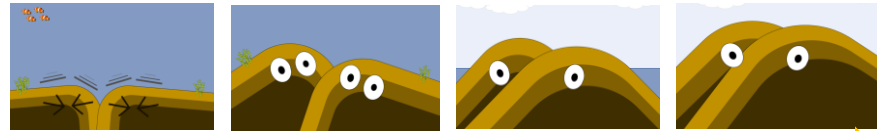
Physical weathering is when rocks can be broken up by ice, which thaws in the rock and makes it crack.

Biological weathering is when plants and fungi, such as lichens and moss grow on the gravestone.



Chemical weathering can be caused by acid rain dissolving the rock over many years.

Rock Type
Rocks react to weathering in different ways. The most common rocks for gravestone are marble, slate and granite.



How mountains are formed.

The tectonic plates are constantly moving. Sometimes they join together and hit one another.

They don't break up, but instead push upwards in the water together.

They merge together underwater and eventually push above the water's surface to form a big mountain.

Eventually, a huge 'fold' mountain is formed. This is how the world's tallest mountain, 'Everest' was made.

Rock & Soil Types



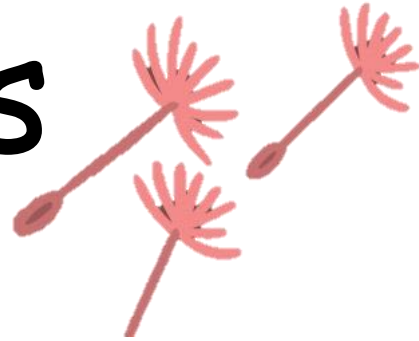
Key Vocabulary

Key Word	Meaning
metamorphic rock	A rock made by changing existing rocks by heat or pressure.
igneous rock	A rock made from solidified lava or magma.
sedimentary rock	Rock made when sand, mud and pebbles join in layers.
soil types	These include clay, chalky and sandy and depend on the feel and density of the soil.
weathering	When rocks get worn away and break due to physical, chemical or biological processes.
acid rain	Rain which becomes acidic due to pollution.
fossil	The remains of a prehistoric animal or plant embedded in a rock.
mineral	A solid substance naturally formed underground i.e. coal.

Unit	Year 3: Rocks	
National Curriculum	Pupils should be taught to: <ul style="list-style-type: none"> • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Recognise that soils are made from rocks and organic matter. 	
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>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)</p> <p>The composition of the Earth. (KS3)</p> <p>The structure of the Earth. (KS3)</p> <p>The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. (KS3)</p>
Key Learning		Key Vocabulary
<p>Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil.</p> <p>Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.</p>		<p>rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, soil, types of soil (e.g. peaty, sandy, chalk, clay)</p>
Common Misconceptions	<p>Some children may think:</p> <ul style="list-style-type: none"> • rocks are all hard in nature • rock-like, man-made substances such as concrete or brick are rocks • materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural' • certain found artefacts, like old bits of pottery or coins, are fossils • a fossil is an actual piece of the extinct animal or plant • soil and compost are the same thing. 	

Unit	Year 3: Rocks				
When	Week 1	Week 2	Week 3	Week 4	Week 5
LQ	How are mountains formed?	Can I recognise the differences between igneous, sedimentary and metamorphic rock?	Can I understand what a fossil is?	What is soils made of?	Can I identify common rocks?
vocab	mountain, Europe, hill, Himalayas, Alps	metamorphic rock, igneous rock, sedimentary rock, magma, mineral	fossil, amber, Jurassic Coast, seashell, extinct	peat, clay soil, chalky soil, sandy soil, texture	sandstone, marble, slate, granite, grain size
Skills	Communicating key concepts.	Asking relevant questions and using different types of scientific enquiries to answer them.	Identifying differences, similarities or changes related to simple scientific ideas and processes.	Using straightforward and scientific evidence to answer questions, or to support their findings.	Grouping and classifying.
Knowledge	Compare and group together different kinds of rocks on the basis of their appearance and physical properties.	Compare and group together different kinds of rocks on the basis of their appearance and physical properties.	Describe in simple terms how fossils are formed when things that have lived are trapped within rock.	Recognise that soils are made from rocks and organic material.	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
Suggested Activity / Lesson Outcome	Mountain Modelling	Make a sedimentary, igneous, and metamorphic rock using chocolate	Exploring fossils	Soil Types Investigation	Identifying Rocks
Scientist / Inventor			Mary Anning		
Assessment Questions	<p>Where are the mountains called the Alps? A mountain is made of rock and earth and rises above the land on which it sits. A mountain has to be over 600 metres tall or it would be called a hill.</p> <p>Which of these is a type of rock? Complete the statement: The Himalayas and {{Alps}} are both sets of {{folded mountains}} that were created when a huge force pushed parts of the Earth's {{crust}} upwards to form {{mountains}}.</p> <p>The Himalayas were once on the {{bottom of the ocean}}. Recognise what a folded mountain looks like.</p>	<p>When a volcano erupts, it shoots out...? Complete the statement: Rocks are generally made of {{chemicals}} called minerals. {{Metamorphic}} rocks are made when a combination of {{heat}} and pressure causes great physical and chemical changes in {{some rock}}, transforming the look of the rock and even changing the {{minerals}} that were there in the first place. True or False: The word 'metamorphosis' means to change shape. Rocks made when magma from a volcano cools and becomes hard is called...? True or False: Limestone is made mostly of compressed bones and shells of millions of tiny creatures.</p>	<p>What is a fossil? How long does it take for a fossil to form? Complete the statement: The {{Jurassic Coast}} is an area of coastline along the southern end of the {{UK}}. This area has become famous for the amount of {{fossils}} that have been found there. The poem She Sells {{Seashells}} on the Seashore is based on the life of Mary Anning, a lady who found thousands of fossils along this particular coastline. What does extinct mean? Which of these are fossils and which are not?</p>	<p>Which of these are types of soil? What is the process called that describes rocks being broken down into smaller pieces, that help make up soil? Complete the statement: The word '{{decompose}}' means to be broken down into smaller parts after {{death}}. After a while, and sometimes with help from {{decomposers}} such as flies, fungi and {{bacteria}}, the animals or plants {{rot}} away and leave {{nutrients}} behind, that enrich the soil they were laying in. True or false: Clay soil is thin and water pours easily through it. What is manure?</p>	<p>Which of these images show granite and which show marble? <i>Select the missing words in the text</i> Marble has many different uses. Blocks of marble are used to make Select... and Select.... Crushed marble is used in Select... , some cleaning products, and some Select.... Which is a sedimentary rock? Granite is usually more than one colour because it is made of different minerals. What colours from the list below can be found in granite? Rocks were a common building material in the past, but which materials have replaced them?</p>

Plants



Knowledge Organiser

Unit: Plants

Key Question 1

How do plants soak up water?

Key Question 2

What is the life cycle of a plant?

Key Question 3

How do plants make their own food?

Key Question 4

Can I name the parts of the flower and describe what they do?

Key Question 5

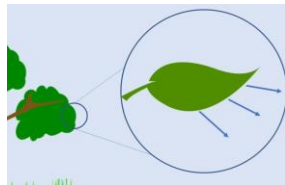
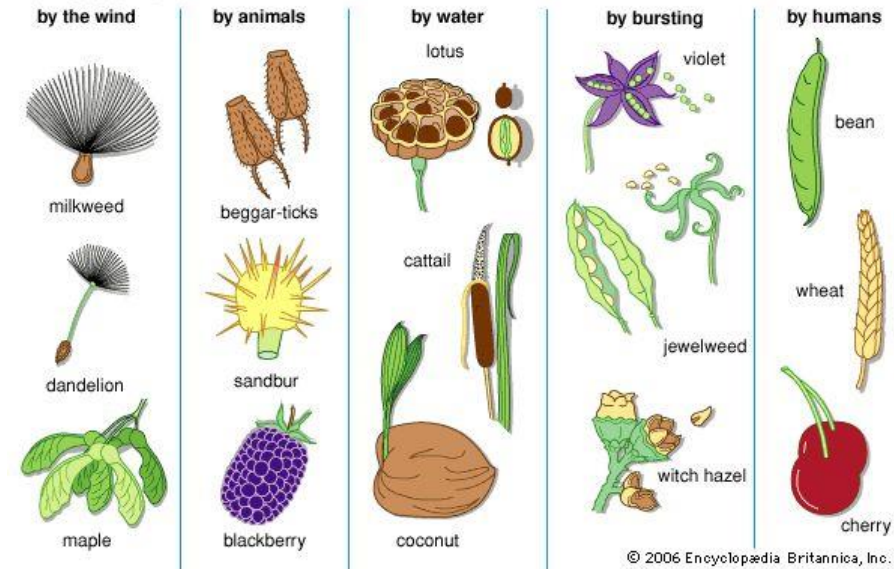
What is the process of pollination?

Key Question 6

What are the different ways plants share their seeds?

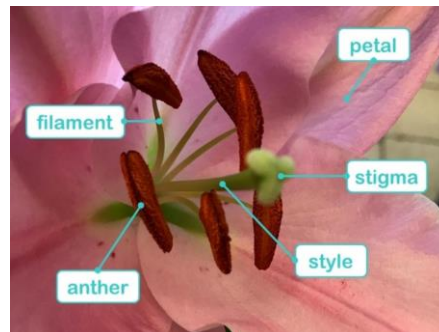


How Seeds Travel



TRANSPIRATION

Water escapes from the leaves, which forces the plant to suck more water up via the xylem to replace what it has lost.



PARTS OF A FLOWER

All these parts are vital. The petal is bright and pretty to attract insects. The anther makes pollen and is held up by the filament. The stigma is sticky to stop the pollen dropping, and this sits on a tall style to make sure the insect can find it!

Key Vocabulary

Key Word	Meaning
Transpiration	Water escaping through plant leaves.
Photosynthesis	The chemical reaction in plants that allows them to make their own food.
Carbon dioxide	A colourless, odourless gas, it is taken in by plants.
Pollination	The process of moving pollen from one flower to another.
Dispersal	The spreading of plant's seeds over a wide area.
Xylem	A tube that transports water from the roots, through the stems, to the leaves.
Phloem	A tube that transports water from the roots, through the stems, to the leaves.
Glucose	A sugar made during photosynthesis.

Unit	Year 3: Plants	
National Curriculum	Pupils should be taught to: <ul style="list-style-type: none"> Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 	
Prior Learning		Future Learning
<ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants) Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants) 		<ul style="list-style-type: none"> Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3)
Key Learning		Key Vocabulary
<p>Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.</p>		<p>photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport</p>
Common Misconceptions	Some children may think: <ul style="list-style-type: none"> plants eat food food comes from the soil via the roots flowers are merely decorative rather than a vital part of the life cycle in reproduction plants only need sunlight to keep them warm roots suck in water which is then sucked up the stem. 	

Unit	Year 3: Plants					
When	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
LQ	How do plants soak up water?	What is the life cycle of a plant?	How do plants make their own food?	Can I name the parts of the flower and describe what they do?	What is the process of pollination?	What are the different ways plants share their seeds?
vocab	root, root hair, absorb, anchor, store	pollination, fertilisation, germination, dispersal, reproduction	photosynthesis, chlorophyll, UV light, carbon dioxide, glucose	anther, stigma, petal, style, filament	nectar, pollination, pollen, pollinator, waggle dance	sycamore, wind dispersal, water dispersal, animal dispersal, explosion dispersal
Skills	Recording findings, using simple scientific languages, questions, labelled diagrams	Oral and written explanations, displays or presentations of scientific concepts.	Recording findings, using simple scientific languages, questions, labelled diagrams.	Recording findings, using simple scientific languages, questions, labelled diagrams.	Presenting learning and knowledge in a dance or drama	Recording findings, using simple scientific languages, questions, labelled diagrams
Knowledge	Explore the parts that flowers play in the life cycle of flowering plants; including pollination, seed formation and seed dispersal.	Explore the parts that flowers play in the life cycle of flowering plants; including pollination, seed formation and seed dispersal.	Explain the part that flowers play in the life cycle of flowering plants, including roots, stem/trunk, leaves, and flowers.	Explore the parts that flowers play in the life cycle of flowering plants; including pollination, seed formation and seed dispersal.	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	Explore the parts that flowers play in the life cycle of flowering plants; including pollination, seed formation and seed dispersal.
Suggested Activity	Drawing roots	Model the life cycle of a plant		Build a model flower and label the key parts. Explain what each part is used for.	Show how pollen is collected.	Seed dispersal investigation.
Scientist / Inventor						
Assessment Questions	What jobs do the roots do?		Why do many plants look green?	Which part of a plant produces pollen? Sort these flower parts into male and female parts. The sepals protect the flower bud as it is growing.	Which of these are pollinators? How do bees collect pollen? How do bees communicate with each other?	



Light



Knowledge Organiser Unit: Light

Light Facts!

Light travels in straight lines.

Light travels at around 300,000 kilometres per second

Light will travel through transparent objects...
...but not opaque ones.

The invisible light waves from the sun are called 'ultraviolet'

- 1 • How are shadows formed?
- 2 • Can I explore light?
- 3 • Can I understand different types of mirrors?
- 4 • Do I know what a periscope is and how to use it?
- 5 • Can I explain how reflective surfaces help keep us safe?
- 6 • Can I recognise that light from the Sun can be dangerous and that there are ways to protect my eyes?

Key Vocabulary

Key Word	Meaning
transparent	A material that allows light to pass through it.
opaque	A material which is not able to be seen through.
reflection	An image seen in a mirror; it happens due to a change in direction of the light wave.
fluorescent	A brightly coloured reflective surface - often used by cyclists.
UV rays	Short light waves made by the sun, which are harmful to our skin.
periscope	A long tube-like object which contains mirrors at certain angles so an object can be seen around corners.
shadow	A dark shape made on a surface when an object blocks light.
sun protection	Something which prevents or reduces the effect of the sun i.e. sun hat, sunglasses, sun cream.

Shadows

A shadow is formed when an opaque object blocks the light.



A shadow will get smaller the further the object is from the light source

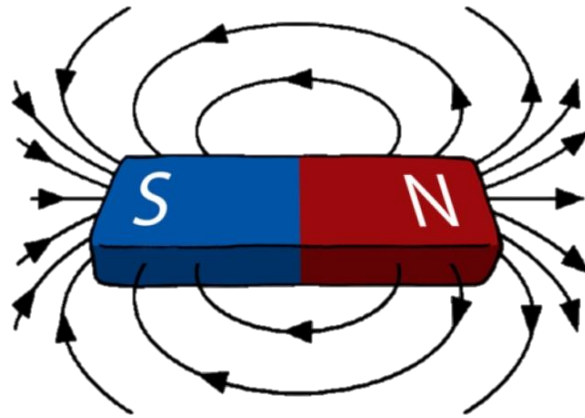
Shadows change angle and length during the day due to the position of the sun in the sky.

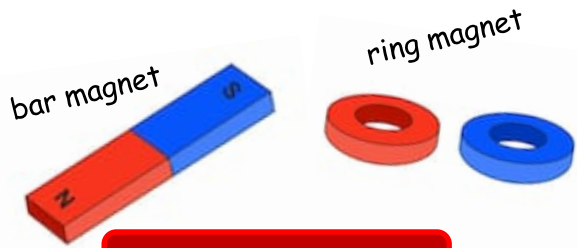


Unit	Year 3: Plants	
National Curriculum	Pupils should be taught to: <ul style="list-style-type: none"> · Recognise that they need light in order to see things, and that dark is the absence of light. · Notice that light is reflected from surfaces. · Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. · Recognise that shadows are formed when the light from a light source is blocked by an opaque object. · Find patterns in the way that the size of shadows change. 	
Prior Learning		Future Learning
Explore how things work. (Nursery - Light) Talk about the differences in materials and changes they notice. (Nursery - Light) Describe what they see, hear and feel whilst outside. (Reception - Light) 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) Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials)		Recognise that light appears to travel in straight lines. (Y6 - Light) Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. (Y6 - Light) Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. (Y6 - Light) Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. (Y6 - Light)
Key Learning		Key Vocabulary
We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface.		light, light source, Sun, sunlight, dangerous
Common Misconceptions	Some children may think: <ul style="list-style-type: none"> · we can still see even where there is an absence of any light · our eyes 'get used to' the dark · the moon and reflective surfaces are light sources · a transparent object is a light source · shadows contain details of the object, such as facial features on their own shadow · shadows result from objects giving off darkness. 	

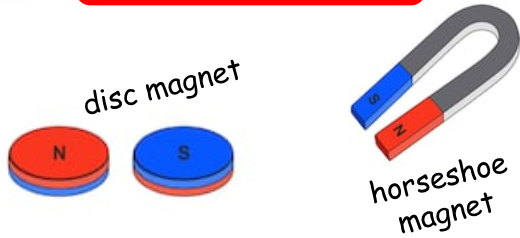
Unit	Year 3: Light				
When	Week 1	Week 2	Week 3	Week 4	Week 5
LQ	How do we see?	Can I identify the difference between reflective materials and light sources?	How are shadows formed?	What affects the size of a shadow?	How can we protect ourselves from harmful light?
vocab	light, light source, Sun, sunlight, dangerous				
Skills	Identifying, grouping and classifying. Sorting a variety of light sources.				
Knowledge	Recognise that we need light in order to see things and darkness is an absence of light.	Notice that light is reflected from surfaces.	Recognise that shadows are formed when the light from a light source is blocked by a solid object.	Find patterns in the way that the size of shadows change.	Recognise that light from the sun can be dangerous and there are ways to protect the eyes.
Suggested Activity / Lesson Overview	Children will learn that darkness is the absence of light, and that without light we cannot see. They will then identify, describe and sort a variety of light sources.	Children will learn that some surfaces reflect more light than others. They may then either identify and describe a range of reflective surfaces, or conduct a reflection investigation using mirrors.	Children will share their ideas about how objects could be tested to determine whether or not they will make a shadow. They may then either test their ideas, or explore the way shadows are created or go on a shadow hunt around the school.	Children will discuss and predict what will happen to a shadow cast by a stick in sunlight throughout the day. They may then conduct a shadow investigation and present their findings using bar graphs.	Children will learn about the benefits and dangers of being in the sun for too long. They will think about how we can protect our skin and eyes from damaging UV light and conduct an experiment around the SPF or amount of sunscreen.
Scientist / Inventor					
Assessment Questions	<ul style="list-style-type: none"> Do children know that we need light in order to see things? Do children know that dark is the absence of light? Can children identify a variety of light sources? 	<ul style="list-style-type: none"> Do children know that light travels in a straight line? Do children know that we see objects when light is reflected from a surface? Do children understand that all objects reflect light to some degree? 	<ul style="list-style-type: none"> Do children know that shadows are formed when light is blocked? Do children know the difference between objects that are transparent, translucent and opaque? Can children explore shadows and record their observations? 	<ul style="list-style-type: none"> Can children explain why shadows created by the Sun change position during the course of a day? Can children plan and carry out an investigation? Can children find patterns in the way the size of shadows change? 	<ul style="list-style-type: none"> Can children name a way to protect their skin or eyes from the sun? Can children identify ways in which a test can be made fair? Are children able to make clear and relevant observations?

Forces and Magnets





types of magnet



Knowledge Organiser

Unit: Forces and Magnets



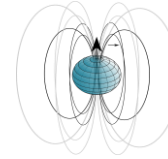
A permanent magnet produces a magnetic field around it that enables it to stick to some types of metal, like iron.

Aluminium and copper are examples of metals which won't stick to a magnet.



Some items can be magnetised by stroking a magnet along them in one direction. This can be useful for things like magnetising a screwdriver.

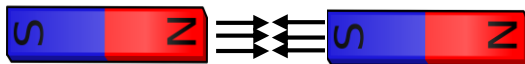
The Earth is a giant magnet, with a North and South Pole. It is magnetic because of the large amount of iron-rich molten rocks under its surface. The Earth's magnetic field stretches into space.



A compass works because its north end is drawn to align with the Earth's magnetic field. A compass has helped people navigate for many years!

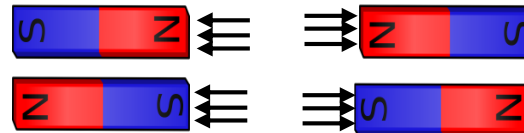
attraction

Remember, with magnets, opposites **attract**. If a North Pole is next to a South Pole, these are attracted to each other and will stick together.



repulsion

If magnetic poles are placed North to North or South to South, they are not attracted and will **repel** each other.



Key Vocabulary

Key Word	Meaning
lodestone	A mineral which is naturally magnetised.
horseshoe magnet	A U-shaped magnet
bar magnet	A magnet in the shape of a bar with the north and south pole at each end.
attract	To pull or draw oneself or itself.
repel	To force back or push away.
compass	An instrument containing a magnetised pointer which shows direction.
magnetic needle	A piece of magnetised steel used on the dial of a compass.

- 1 • What is magnetism?
- 2 • What are the different types of magnets?
- 3 • Do I understand that the Earth behaves like a magnet?
- 4 • What is the law of magnetic attraction?
- 5 • Do magnetic needles always point north?
- 6 • How do things move on different surfaces?

Unit		Year 3: Forces and Magnets	
National Curriculum	Pupils should be taught to: <ul style="list-style-type: none"> • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. 		
Prior Learning		Future Learning	
Explore how things work. (Nursery - Forces) Explore and talk about different forces they can feel. (Nursery - Forces) Talk about the differences between materials and changes they notice. (Nursery - Forces) Explore the natural world around them. (Reception - Forces) Describe what they see, hear and feel whilst outside. (Reception - Forces) 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)		Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (Y5 - Forces) Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. (Y5 - Forces) Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. (Y5 - Forces) Magnetic fields by plotting with compass, representation by field lines. (KS3) • Earth's magnetism, compass and navigation. (KS3)	
Key Learning		Key Vocabulary	
A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles - a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other - repel. If two unlike poles, e.g. a north and south, are brought together they will pull together - attract. For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.		Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	
Common Misconceptions		Some children may think: <ul style="list-style-type: none"> • the bigger the magnet the stronger it is • all metals are magnetic. 	

Unit	Year 3: Forces and Magnets					
When	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
LQ	What is magnetism?	What are the different types of magnets?	Do I understand that earth behaves like a magnet?	What is the law of magnetic attraction?	Do magnetic needles always point north?	How do things move on different surfaces?
vocab	lodestone, iron, ore, attract, magnetic strip	bar magnet, cow magnet, horseshoe magnet, disc magnet, flexible magnet	North Pole, magnetic field, molten rock, compass, solar radiation	attract, repel, propulsion, Maglev train, high speed train	compass, magnetic needle, direction, orienteering, Magnetic North	direction, surface, pendulum, tilt, friction
Skills	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	Reporting on findings from enquiries, including oral and written explanations, displays or presentation of results and conclusions.	Making systematic and careful observations.	Making systematic and careful observations	Making systematic and careful observations, using a range of equipment.	Using straightforward scientific evidence to answer questions or to support their findings.
Knowledge	Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.	Observe how magnets attract or repel each other and attract some materials and not others.	Observe how magnets attract or repel each other and attract some materials and not others; describe magnets as having two poles, predict whether two magnets will attract or repel each other; depending on which pole are facing.	Observe how magnets attract or repel each other and attract some materials and not others; describe magnets as having two poles, predict whether two magnets will attract or repel each other; depending on which pole are facing.	Observe how magnets attract or repel each other and attract some materials and not others; describe magnets as having two poles, predict whether two magnets will attract or repel each other; depending on which pole are facing.	Compare how things move on different surfaces.
Suggested Activity	Testing magnetic materials	Identifying differences, similarities or changes related to simple scientific ideas and processes. How magnets repel and attract.	Complete an orienteering challenge using a compass!	Magnetic Shielding	Make a leaf compass	Have a go at seeing how objects slide over different surfaces!
Scientist / Inventor	William Gilbert					
Assessment Questions	<p>What does magnetic mean?</p> <p>What does non-magnetic mean?</p> <p>How does a magnet identify objects which are magnetic or non-magnetic</p> <p>Do they use the words magnetic and non-magnetic appropriately?</p> <p>What does attract and repel mean?</p> <p>A magnetic force is...</p> <p>Magnets are attracted to...(iron)</p>	<p>What happens when you push two north poles together?</p> <p>What happens when you push a north and south pole together?</p> <p>What is a magnetic field?</p> <p>What uses can you think of for (different types of magnet)?</p> <p>The end of a magnet is called a...(pole)</p> <p>A magnetic pole is...</p> <p>North and south ends of a magnet will... (attract)</p> <p>North and north ends of a magnet will ... (repel)</p>	<p>How are magnetic fields used?</p> <p>What does attract and repel mean in terms of magnets?</p> <p>To create a magnetic field with copper wire you need to...</p> <p>The high-speed train in China is called a...(maglev train).</p> <p>Opposite poles...(attract).</p> <p>The pattern of force around a magnet is called a magnetic...(field)</p>	<p>How does a compass work? Can you follow a set of directions using a compass? What are the points on a compass called?</p> <p>How is a compass useful for people when they travel?</p> <p>The points on a compass are called...</p> <p>A compass works by... (magnetism to the earth)</p> <p>A compass points magnetic north because...</p> <p>A compass is useful in navigation and travel because...</p>	<p>Is friction a good or bad thing?</p> <p>How could we reduce friction?</p> <p>How are the textures of the materials different?</p> <p>Objects are slowed down by...</p>	



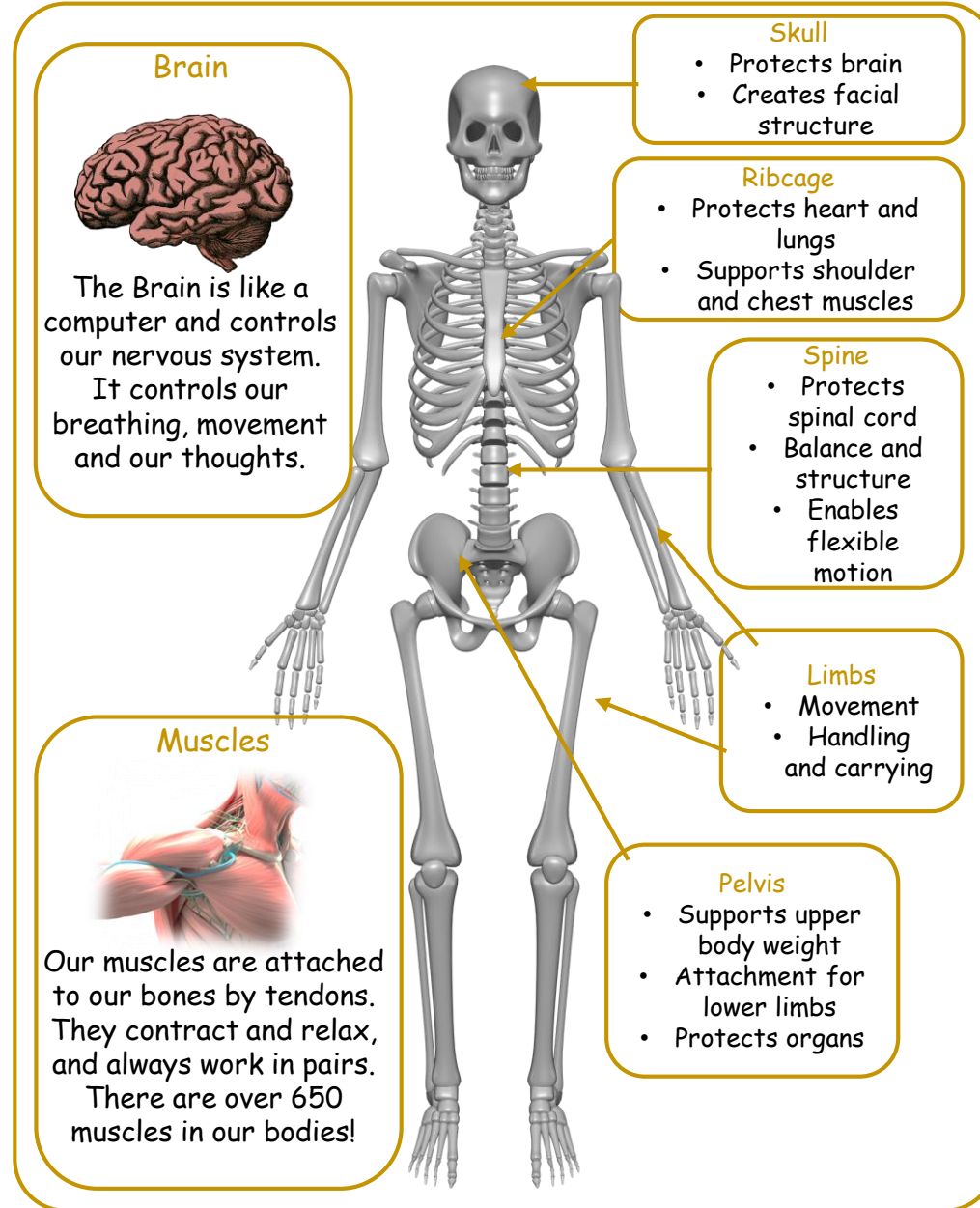
Animals, Including
Humans

What are the different types of nutrients?

- Protein help your body to grow and repair itself examples include **red meat, yogurt, beans**
- Carbohydrates give you energy examples include **bread, potatoes, pasta**
- Fats give you energy examples include **nuts, oils, avocados**
- Vitamins keep your body healthy examples of foods high in vitamins include **oranges, carrots and nuts**
- Minerals keep your body healthy examples of foods high in vitamins include **milk, sweetcorn, spinach**
- Fibre helps you to digest the food that you have eaten examples of foods high in fibre include **wholegrain bread, cereals and lentils**
- Water helps to move **nutrients** in your body and get rid of waste that you don't need examples of foods high in water include **celery, cucumber, tomatoes**

- 1 • Is nutrition important
- 2 • How can I keep healthy through diet?
- 3 • What are voluntary and involuntary muscles?
- 4 • What are the different parts of the skeleton?
- 5 • What are tendons and ligaments?
- 6 • How are skeletons and muscles used for support, protection and movement?

Knowledge Organiser Unit: Animals, Including Humans



Key Vocabulary

Key Word	Meaning
skeleton	The set of bones on a human or animal, joined together to make our structure.
tendon	A tough, elastic tissue which connects the muscles and bones
involuntary muscles	Muscles not controlled by an individual's will.
voluntary muscles	Muscles whose actions are controlled by an individual's will

What are the different food types?

- Fruit and vegetables
- Bread, rice, potatoes, pasta and other **starchy** foods.
- Milk and dairy
- Oils and spreads
- Meat, fish, eggs, beans and other non-dairy sources of protein.



Unit	Year 3: Forces and Magnets	
National Curriculum	<p>Pupils should be taught to:</p> <p>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.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	
Prior Learning		Future Learning
<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals, including humans)</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans)</p> <p>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)</p>		<p>Describe the simple functions of the basic parts of the digestive system in humans. (Y4 - Animals, including humans)</p> <p>Identify the different types of teeth in humans and their simple functions. (Y4 - Animals, including humans)</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans)</p>
Key Learning		Key Vocabulary
<p>Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients - carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water - and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients.</p> <p>Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support.</p>		<p>Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine</p>
Common Misconceptions	<p>Some children may think:</p> <ul style="list-style-type: none"> • certain whole food groups like fats are 'bad' for you • certain specific foods, like cheese are also 'bad' for you • diet and fruit drinks are 'good' for you • snakes are similar to worms, so they must also be invertebrates • invertebrates have no form of skeleton. 	

Unit	Year 3: Animals, Including Humans					
When	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
LQ	Is nutrition important?	How can I keep healthy through diet?	What are voluntary and involuntary muscles?	What are the different parts of the skeleton?	What are tendons and ligaments?	How are skeletons and muscles used for support, protection and movement?
vocab	nutrition, vitamins, balanced diet, protein, carbohydrate	portion, food groups, balanced diet, vitamins, ingredients	involuntary muscles, voluntary muscles, biceps, triceps, hamstring muscle	skeleton, bones, skull, X-ray machine, rib cage	Achilles tendon, cartilage, marrow, ligament, tendon	support, protect, vertebrae, movement, contract and relax
Skills	Observing closely, using simple equipment	Identifying differences, similarities or changes related to simple scientific ideas and processes.	Reporting on findings from enquiries, including oral and written explanations, or presentation of results and conclusions.	Using straight forward scientific evidence to answer questions, or to support their findings.	Reporting on findings from enquiries, including oral and written explanations, or presentation of results and conclusions	Reporting on findings from enquiries, including oral and written explanations, or presentation of results and conclusions.
Knowledge	Describe the importance of exercise, eating the right amount of different types of foods, and hygiene.	Identify that animals, including humans, need the right types and amount of nutrient, and that they cannot make their own food; they get their nutrient from what they eat.	Identify that humans and some animals have skeletons and muscles for support, protections and movement.	Identify that humans and some animals have skeletons and muscles for support, protections and movement.	Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Identify that humans and some animals have skeletons and muscles for support, protection and movement.
Suggested Activity	Ask your peers what their favourite food groups are and create a bar graph.	Create a food diary.	Voluntary Muscles Test	Construct and label the human skeleton	Create a model of the human hand to show how tendons and ligaments enable movement	Play a game of Body Bingo to test out your knowledge of the skeleton and muscles
Scientist / Inventor						
Assessment Questions						