# **Curriculum Overview: Science**

р



# **Dorchester Primary School**

A Hull Collaborative Academy Trust school.



# Working together in a safe and inclusive environment to develop creative, disciplined, and aspirational pupils.



# **The Dorchester Curriculum**



# **The Vision**

Our curriculum vision at Dorchester is to provide children with an ambitious, academic and personal curriculum which will open up future opportunities for success.

# **Curriculum Aims**

# Values

Our curriculum aims to provide:

- A cumulative acquisition of concepts, knowledge and skills which enables all children to achieve their goals
- A creative, enquiry based curriculum which promotes inquisitive minds, independence and a love for learning.
- A sense of belonging, identity and community to succeed in the modern world

These aims are underpinned by our school values:

- Our school values respect, so our curriculum provides plentiful opportunities for children to work collaboratively, practice active listening, turn taking and acts of service.
- Our school values tolerance therefore our curriculum promotes social awareness and represents diverse voices
- Our school values self-belief so our curriculum promotes a growth mindset and develops independence
- Our school values empathy therefore our curriculum provides opportunities for children to view the world from different perspectives
- Our school values resilience so our curriculum promotes goal setting and problem solving

# **Curriculum Concepts**

Children will also develop their understanding of identified curriculum concepts throughout all subjects. These concepts branch across our whole curriculum, creating horizontal links across all subjects. They aim to develop flexible knowledge and skills that children can apply to multiple curriculum areas.





# **Dorchester Learning Framework**

We have created a learning framework to support our teachers in planning, delivering and assessing the curriculum. This framework has been devised using research into knowledge acquisition and working memory to enable all children to learn and remember what we teach.

Progress at Dorchester means 'knowing more and remembering more'

#### Assessment

We have adopted a three-tier assessment model for wider curriculum subjects. Teachers will gather assessment information on what children have learnt (and retained): in the short term (e.g. within / after a lesson), the medium-term (e.g. after a unit of work), and long-term (e.g. at the end of their phase or key stage). Assessments will be used to inform the learning moving forward.

# **Curriculum Timetabling**

At Dorchester, we want to ensure that we celebrate the talents of all pupils and provide everyone with opportunities to shine. Therefore, we have calculated the number of teaching hours available and have ensured that all pupils receive a broad and balanced curriculum based on the starting points of our children

Maths, Reading (including EARS for fluency and book talk KS1) and Writing (including spelling and handwriting are taught daily.

Science, RE, PE, Music, PSHE and MFL (KS2) are taught weekly except where blocking of other subjects is needed. Science is built within the curriculum subject areas as well as some standalone knowledge

History and Geography along with Art and DT are taught in alternating blocks per half term.

Am (Hours)	Pm (Hours)
2hrs 45min	2hr 25mins
	Am (Hours)2hrs 45min2hrs 45min2hrs 45min2hrs 45min2hrs 45min

Curriculum Area	Hours per day	Weekly (B = Blocked)	Hours Per Year
English			
Reading	1	5 hrs	185 hours
Reading-Fluency	15 mins	1hr 15 mins	46 hours
			231 hour
Writing	45 mins	4 hr 15 mins	157 hours
- Handwriting	10 mins	50 mins	30
- Spelling	10mins	50mins	30
			217 hours
Maths			
Maths	1	5	185 hours
Computer Sciences			
Science	-	1hr	35 hours
Science	-	45 mins	26 hours
Creative			
Art	-	1hr 30mins (B)	24 hours
Design and Technology	-	1hr 30 mins (B)	24 hours
Music	-	20 mins	11 hours
Humanities			
History	-	1hr 30 mins (B)	24 hours
Geography	-	1hr 30 mins (B)	24 hours
RE	-	45 minutes	24 hours
Additional			
Physical Education	-	1 hour	35 hours
MFL	-	20 mins	11 hours
PSHE	-	20 mins	11 hours



# **The Science Curriculum**



# **The Science Vision**

At Dorchester Primary, our vision is that children will become curious, creative and critical scientific thinkers who are able to explore and understand the world with a sound scientific knowledge and vocabulary. The national curriculum for Science drives the core planning. We aim to give our children a deeper contextual understanding of their learning by offering opportunities to apply Science skills to other curriculum areas as the curriculum builds from the EYFS.

# **Science Curriculum**

# Personal Development in the Science Curriculum

Our Science curriculum will:

- Teach the children key substantive knowledge through three key lenses: Biology, Chemistry and Physics.
- Teach the substantive concepts of Plants, Living Things and Their Habitats, Materials, Animals Including Humans, Light and Sound, Rocks, Forces, Earth and Space and Evolution and Inheritance and build on these Key Stage by Key Stage.
- Teach the procedural enquiry types Comparative and Fair Testing, Pattern Seeking, Secondary Sources, Observing Over Time and Grouping and Classifying through the disciplinary skills of Asking scientific questions, Presenting results, Planning an enquiry, Interpreting results, Observing closely, Drawing conclusions (KS2 only), Taking measurements, Making predictions (KS2 only), Gathering and recording results and Evaluating an enquiry (KS2 only).
- Ensure children know more, remember more and can do more in science.

- Citizenship we nurture students' understanding of citizenship, their sense of belonging, and their role in shaping the world around them by learning about living things and their habitats and how they have changed over time within evolution and inheritance.
- Character we promote empathy and compassion through learning about animals including humans, encouraging responsibility towards shaping the world by learning about environmental impact humans have on a place and encourage collaboration and teamwork through enquiries. We also build up self-belief and aspirations through the development of science capital.
- British Values –we explore democracy within how we create our working scientifically teams; how rules of law are used with enquiries to maintain order and fairness with roles set and learn about mutual respect and tolerance by working in teams.
- Inclusion and equal opportunities we promote inclusion and equal opportunities by ensuring diverse and multicultural representations of scientists are shown throughout the curriculum.
- Wider opportunities we give opportunities to take part in a science club to widen their experiences of the subject.

# Science Knowledge Overview

	Lenses	
Biology	Chemistry	Physics
Pupils will study many living organisms and their structure, life-cycles, adaptations and the environment and habitats they live in. They will identify what it means to be a living organism and compare and contrast both plants and animals.	Pupils will study the properties of matter and ho matter interacts with energy. This includes lookin everyday materials along with their properties an Children will look at how chemical reactions are irreversible and what makes a chemical reaction	w Pupils will learn about light and s ng at travel. They will also discover ho objects, including magnetism, fri including Earth and space. Furth also look at states of matter a and matter can be changed, a changes are reversible or irrev



### **Disciplinary Skills in the Science Curriculum**

Asking scientific	Presenting results	Planning an	Interpreting results	Drawing	Taking	Making	Gathering and recording
questions	Children will	enquiry	Children will use their	conclusions (KS2)	measurements	predictions	results
Children will begin	communicate their	The children are	observations and	Children: identify	Children take	(KS2)	Children start by using
by asking questions	findings to an	involved in	ideas to suggest	causal relationships	measurements, initially	Children use the	practical resources
with support and	audience both orally	planning how to	answers to questions	and patterns in the	by comparisons using	scientific	provided to gather
then develop the	and in writing, with	use resources	and support their	natural world from	nonstandard units, then	knowledge	evidence to answer
ability to ask them	support, and the	provided to answer	findings, using test	their evidence;	use a range of	gained from	questions generated by
more	begin to develop	the questions using	results to make	identify results that	equipment for	enquiry work to	themselves or the teacher
independently,	their communication	different types of	predictions to set up	do not fit the	measuring length, time,	make	and then lead on to choose
eventually using	by adapting their	enquiry, helping	further comparative/	overall pattern;	temperature and	predictions they	their own resources and
their prior	presentations to a	them to recognise	fair test and identify	draw conclusions	capacity using standard	can investigate	way to record their
knowledge to	specific audience	that there are	scientific evidence	based on their	units, eventually	using	findings, using tables and
create their own	using relevant	different ways in	that has been used to	evidence and	choosing the most	comparative	graphs suitable to their
questions for	scientific language	which questions	support or refute	current subject	suitable equipment.	and fair tests.	mathematic development.
enquiries.	and illustrations.	can be answered.	ideas or arguments.	knowledge.			



sound and how these ow forces act upon riction and gravity, hermore, children will and how materials and whether these eversible.

Light and Sound

Evolution and Inheritance



# Evaluating an enquiry (KS2)

Children identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used.

# Observing closely

Children make careful observations to support identification, comparison and noticing change using age appropriate equipment. Observations become systematic and begin to include more secondary sources as they progress through year groups.

# Science Progression Knowledge

hcat academy	orative trust	<u>(</u>	Children should be able to reca	Progression of Core Facts in Sc all these key facts, and complet	<u>tience</u> te the sentences to be at an AF	RE standard
Animals	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5
Including Humans	<ul> <li>Explore the natural world around them, making observations and drawing pictures of animals and plants.</li> <li>Manage their own basic hygiene and personal needs, including dressing, going to the toilet.</li> <li>This is my head, shoulders, knees, toes, hands, fingers, arms, elbows, legs, feet, back, eyes, ears, mouth, nose, stomach, teeth, hair, neck.</li> </ul>	<ul> <li>The 5 senses are smell, touch, hearing, sight and taste</li> <li>A carnivore eats meat, a herbivore eats plants and an omnivore eats both</li> <li>A frog (insert other amphibian as appropriate) is an amphibian because</li> <li>A penguin (insert other bird as appropriate) is a bird because</li> <li>A salmon (insert other fish as appropriate) is a fish because</li> <li>A lion (insert other mammal as appropriate) is a mammal because</li> <li>A snake (insert other reptile as appropriate) is a reptile because</li> </ul>	<ul> <li>Animals need food, water and air to survive</li> <li>Animals reproduce and have offspring.</li> <li>E.g. Birds lay eggs, while mammals gives birth to live young.</li> <li>Humans need to eat a balanced diet to be healthy.</li> </ul>	<ul> <li>Animals cannot (come back to life/survive without food and water etc)</li> <li>Nutrition comes from (the food animals eat)</li> <li>Humans and some animals have skeletons because (they support the muscles/protect vital organs)</li> <li>Humans and some animals have muscles because (it helps them move etc)</li> </ul>	<ul> <li>The digestive system is (a group of organs that work together to break down food into smaller components so that nutrients can be absorbed).</li> <li>The parts of the digestive system are (mouth, oesophagus, liver, stomach, pancreas, small intestine, large intestine, rectum, anus)</li> <li>The (insert organ from above) in the digestive system does(e.g. the stomach in the digestive system mixes food and drink with acid)</li> <li>Humans have the following teeth (molars, canines, incisors)</li> <li>All food chains start with a (producer)</li> <li>A primary consumer is (an animal which feeds on the producer)</li> <li>A secondary consumer is (an animal which feeds on another consumer)</li> </ul>	<ul> <li>Puberty is of physical through whody matubody capabre reproduction.</li> <li>Changes in (hair grow etc)</li> <li>Changes in (hair grow voice etc)</li> <li>The gestate a human in 38 and 42.</li> <li>When your (changes wour body)</li> </ul>
Living	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5
their Habitats	<ul> <li>Explore the natural world around them, making observations</li> </ul>		<ul> <li>A producer is (an organism that makes its</li> </ul>		<ul> <li>I have grouped these animals because (they're all mammals,</li> </ul>	• mammal/ etc) repro

	Year 6
s (the process changes hich a child's res into an adult ble of sexual on). n girls are <i>x</i> th, periods n boys are <i>x</i> th, changes in tion period of s (between weeks) a get older will happen in <i>x</i> etc).	<ul> <li>The circulatory system is (a network that takes oxygen around the body)</li> <li>The circulatory system includes (heart, blood vessels, blood etc)</li> <li>The (insert component) in the circulatory system does (e.g. the heart pumps blood around the body)</li> <li>Nutrients, water and oxygen are transported through the body by (blood in blood vessels)</li> <li>Drugs affect the body by (helping cure ailments, affecting how the body can function etc)</li> <li>Diet can affect the body by (creating excess fat cells, supplying energy, improving growth etc)</li> <li>Exercise can affect the body by (improving strength etc)</li> </ul>
	Year 6
(A bird/sunflower duces sexually.	<ul> <li>A micro-organism is (an organism of microscopic size, which may exist in its</li> </ul>

	<ul> <li>and drawing pictures of animals and plants.</li> <li>Begin to understand the need to respect and care for the natural environment and all living things.</li> </ul>		<ul> <li>own food/starts a food chain)</li> <li>A prey is (an animal which is eaten by a predator)</li> <li>A predator is (an animal which eats another animal)</li> <li>(any living organism) is living because (it follows all of the seven indicators of life MRS NERG)</li> <li>(Any dead organism) is dead because (it doesn't follow all of the seven indicators of life MRS NERG but it used to)</li> <li>(Any inanimate object) has never been alive because (it doesn't follow all of the seven indicators of life MRS NERG but it used to)</li> <li>(Any inanimate object) has never been alive because (it doesn't follow all of the seven indicators of life MRS NERG and never has)</li> <li>A habitat is (the place or environment where a plant or animal lives and grows)</li> <li>(E.g. a snake) lives in (e.g. grass) because (e.g. it is easily camouflaged from prey)</li> <li>A micro-habitat is (a smaller part of the habitat that has specific physical conditions that</li> </ul>		<ul> <li>they live in the same habitat etc)</li> <li>(Fill as appropriate to location) is found in my local environment.</li> <li>(Fill as appropriate to location) is found in the wider environment.</li> <li>Environments change by (droughts and floods, rising temperatures or deforestation etc)</li> <li>Environments change when (these above change, either naturally or through human interaction)</li> <li>(an example of a living organism, such as polar bear) is impacted when the environment changes because (e.g. the temperature has risen so the ice caps have melted and they can no longer use them to enable their fishing)</li> </ul>	<ul> <li>strawl reprod</li> <li>The st of a (chose e.g. fr tadpo</li> <li>The si (e.g. b egg)</li> <li>The di (e.g. o a met</li> </ul>
ants	EYFS	Year 1	habitat that has specific physical conditions that are helpful for an organism) Year 2	Year 3	Year 4	Year 5
	• Explore the natural world around them, making observations	• A deciduous tree is (a tree that loses its leaves seasonally)	<ul> <li>When I plant a seed/ bulb (gestation) happens.</li> </ul>	• The (stigma) does (collect	•	•

(A /berry/aphid/rose) oduces asexually. tages in a lifecycle

e animal or plant, rog) include... (egg, ole, froglet, frog) imilarities are... both hatch from an

lifferences are... only one undergoes tamorphosis) single-celled form or as a colony of cells)

 These are \_\_\_\_\_\_ (mammals) because they have the following characteristics... (warm blooded, give birth to live young etc using a classification key)

# Year 6

٠

	<ul> <li>and drawing pictures of animals and plants.</li> <li>Describe and comment on things they have seen whilst outside, including plants and animals.</li> <li>Notice changes in the leaves, weather and seasons.</li> <li>Plants grow from (seeds, bulbs, themselves)</li> </ul>	<ul> <li>An evergreen tree is (a tree which keeps its leaves all year round)</li> <li>The difference between a wild and garden plant is (wild plants are not planted by humans)</li> <li>The parts of a flowering part are (the roots, the stem, the leaves and the petals)</li> <li>The parts of a tree include(roots, trunks, bark, branches, leaves, crown)</li> <li>(Bluebells, dandelions, oak tree etc) is a wild plant.</li> <li>(Bamboo, cactus, orchid etc) is a garden plant.</li> </ul>	<ul> <li>(Seedlings / stem) grow upwards from the seed/ bulb.</li> <li>(roots) grow down from the seed/bulb.</li> <li>A plant will need (sunlight/nutrients/ water/space) to grow and survive.</li> </ul>	<ul> <li>pollen grains and germinate them)</li> <li>Plants also need <u>(sunlight/nutrients/water/soil/air/space) to survive.</u></li> <li>Without (the above) to survive.</li> <li>Without (the above) the plant will(die)</li> <li>Water in a plant is transported by (roots / cells / stem / leaves)</li> <li>Pollination is (the transfer of pollen from an anther of a plant to the stigma of a plant, later enabling fertilisation and the production of seeds)</li> <li>Seed dispersal is (when seeds are transported by wind or animal)</li> <li>Seed formation is (germination)</li> <li>The part of the flowering plant in the lifecycle is (point to the mon a flower)</li> </ul>		
Evolution	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5
and						•

Year 6
<ul> <li>Fossils provide us with (evidence about the past)</li> <li>Living things have changed overtime because (of evolution and natural selection)</li> <li>Characteristics are passed onto the offspring by (genetic inheritance/DNA)</li> <li>Adaptations in plants and animals can lead to (evolution and changes to the species)</li> <li>Inheritance is (the passing of genetic traits from an offspring's parents)</li> </ul>

Forces and	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	<ul> <li>Evolution is (the change in the heritable characteristics of organisms over succeeding generations).</li> <li> (E.g. snow hare) is adapted to its environment by (having long, flat feet which help them not sink in the snow).</li> <li>Year 6</li> </ul>
magnets	<ul> <li>Explore how things work.</li> <li>Explore and talk about different forces they can feel.</li> <li>Explore the natural world around them.</li> <li>Describe what they see, hear, and feel whilst outside.</li> </ul>			<ul> <li>(cars) moves faster/ slower on a(rough) surface.</li> <li>Most forces such as (friction) need (contact/energy)</li> <li>Magnetic forces act at a  (distance)</li> <li>Attract means(the magnets are pulled to each other / a magnetic material)</li> <li>Repel means (the magnets pushed away from each other / a magnetic material)</li> <li>(Iron) is a magnetic material because (a magnet is attracted to it)</li> <li>A magnet has (two) poles. These are called (north) and</li> </ul>		<ul> <li>Gravity is (the pull a planet, such as Earth, has on objects in its radius/atmosphere)</li> <li>Friction is (the force between two surfaces that are sliding, or trying to slide, across each other)</li> <li>Air resistance is (also known as drag, is a force that slows things down when they move through the air)</li> <li>Water resistance is (also known as drag, is a force that slows things down when they move through the air)</li> <li>A mechanism is used to (including levers, pulleys and gears, allow us to use a smaller force to have a greater effect and change motion).</li> </ul>	
Electricity	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	•	•	•	•	<ul> <li>A source of electricity (mains or battery) is needed for electrical devices to work</li> <li>Electricity sources push electricity round a circuit</li> </ul>	•	<ul> <li>Batteries are a store of energy. This energy pushes electricity round the circuit. When the battery's energy is gone it stops pushing. Voltage measures the 'push'</li> </ul>

					<ul> <li>More batteries will push the electricity round the circuit faster</li> <li>Devices work harder when more electricity goes through them</li> <li>A complete circuit is needed for electricity to flow and devices to work</li> <li>Some materials allow electricity to flow easily and these are called conductors</li> <li>Materials that don't allow electricity to flow easily are called insulators</li> </ul>	
Light	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5
				<ul> <li>We need(light) to see.</li> <li>Dark happens when (the absence of light)</li> <li>(Glass) is a transparent material because(it allows light through without scattering / can bee seen through)</li> <li>(Wax paper) is a translucent material because (it allows some light to pass through, but not enough to see clearly through them)</li> <li>(stone) is an opaque material because (it does not let any light pass through)</li> <li>Shadows are formed</li> </ul>		
Sound	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5

<ul> <li>The greater the current flowing through a device the harder it works</li> <li>Current is how much electricity is flowing round a circuit</li> <li>Electricity is a type of energy that builds up in one place (static), or flows from one place to another (current electricity)</li> </ul>
Year 6
<ul> <li>Animals see objects when light is (reflected) off that object and enters their eyes.</li> <li>Light travels in  (straight) lines</li> <li>Shadows are the same shape as the object that produces them because (light travels in straight lines and cannot bend around the shape).</li> </ul>
Year 6

					<ul> <li>Sound is produced when (objects vibrate)</li> <li>Sound travels in (Waves)</li> <li>Sound moves through all materials by making them (Vibrate)</li> <li>Bigger vibrations produce(louder sounds)</li> <li>smaller vibrations produce(quieter sounds)</li> <li>Faster vibrations (higher frequencies) produce (high pitched sounds)</li> <li>Slow vibration (quieter frequencies) Produce (low frequencies) The(closer/further) to the sound of the source the (quieter/louder) it bacemes</li> </ul>		
Materials/	FYES	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
states of matter	<ul> <li>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</li> <li>Use all their senses in hands-on exploration of natural materials.</li> <li>Explore collections of materials with similar and/or different properties.</li> <li>Talk about what they see.</li> <li>Understand some processes and changes</li> </ul>	<ul> <li>Wood, plastic, glass, metal, water and rock are materials</li> <li>Objects are made from materials</li> <li>Materials have different physical properties</li> <li>(material one) is different to(material two) because(e.g. material one is rougher)</li> <li>(material one) is similar to(material two) because</li> </ul>	<ul> <li>Materials can be changed by physical force (twisting, bending, squashing and stretching).</li> <li>The same material can be used for different 'things/purposes/jobs'</li> <li>Materials are selected for purpose based on their characteristics (e.g. wood is strong, wood is flammable)</li> </ul>	•	<ul> <li>Solid materials are (those which keep their shape/do not flow etc)</li> <li>Liquid materials are (those which take their shape from the container they're in, flow etc)</li> <li>Materials that are gases are (those which are often invisible, have no fixed shape, can be squashed)</li> <li>Examples of solid materials include (ice, wood, sand etc)</li> </ul>	<ul> <li>Some materials that are hard include (diamond, quartz, granite etc)</li> <li>Some materials that are soluble include (coffee granules, salt, sugar etc)</li> <li>Some materials that are transparent include (clear glass, clean air, clear water etc)</li> <li>Some materials that conduct electricity include (iron, steel, copper etc)</li> <li>Some materials that conduct heat include (iron, steel, copper etc)</li> </ul>	

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5
EYFS	<ul> <li> (e.g. both materials are flexible)</li> <li>Compare a variety of everyday materials</li> <li>Compare and group materials with similar physical properties.</li> </ul>	Year 2	Year 3	<ul> <li>Examples of liquid material include (water, honey, milk etc)</li> <li>Examples of materials that are gases include (steam, helium, oxygen etc)</li> <li>The process required to change a solid to a liquid is called (melting)</li> <li>The process required to change a liquid to a gas is called (condensation)</li> <li>The process required to change a gas to a liquid is called (condensation)</li> <li>The process required to change a liquid to a solid is called (freezing)</li> <li>Increasing the temperature will cause the rate of evaporation to (increase).</li> <li>In the water cycle evaporating is important because (it ensures fresh water enters the water cycles)</li> <li>In the water cycle condensation is important because (it turns the gaseous water into usable liquid water)</li> <li>Year 4</li> </ul>	<ul> <li>Some matering magnetic in cobalt, nich cobal</li></ul>

erials that are include... (iron, kel etc) is made when e is mixed with olution has ed the solid an be by ... ion) s the process n insoluble mixed with a the process eparating a f two solids er in size) ng is the hen... (liquids gases) le change is that can be /a physical nere both can return to nal state) of reversible nclude... utter, on of water, f water etc) nange occurs kes a new his means it is \_\_\_\_ (an le/a chemical nd we cannot original back to their ate) Year 6

Seasonal Changes	<ul> <li>Use all their senses in hands-on exploration of natural materials.</li> <li>Talk about what they see.</li> <li>Understand some changes in the natural world around them, including the seasons.</li> <li>There are four seasons</li> <li>The 4 seasons are (spring, summer, autumn, winter)</li> <li>Weather changes across the year (some weather can happen in every season)</li> <li>There are lots of different types of weather (rain, sun, wind, storms)</li> </ul>	<ul> <li>The cycle of the seasons are (spring, summer, autumn, winter)</li> <li>In Winter/ Spring/</li> <li>Summer/ Autumn (e.g. it is normally cold) but in Winter/ Spring/ Summer/ Autumn (e.g. it is hotter)</li> <li>We often see (weather) in Winter/ Spring/ Summer/ Autumn <ul> <li>In Summer the day length is (shorter)</li> </ul> </li> </ul>				
Rocks	EYFS •	Year 1	Year 2	<ul><li>Year 3</li><li>There are different</li></ul>	Year 4	Year 5
				<ul> <li>types of rocks</li> <li>There are different types of soil</li> <li>Soil changes over time</li> <li>Different plants grow in different soils</li> <li>Fossils tell us what has happened before</li> <li>Fossils provide evidence that living things have changed over time</li> <li>Palaeontologists use fossils to find out about the past</li> </ul>		
Earth and	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5
Space	•	•	•	•	•	<ul> <li>Stars, pla moons h mass the things, ir other du called gr</li> </ul>



# Science Long Term Plan

# Cycle 1

YEAR	Year 1 / Year 2		Year 3 / Year 4		Year 5 / Year 6				
TERM	AUTUMN	SPRING	SUMMER	AUTUMN	SPRING	SUMMER	AUTUMN	SPRING	SUMMER
Science Term 1	Changing Seasons (Geog and Science)	Changing Seasons (Geog and Science)	Changing Seasons (Geog and Science)	States of matter	Sound	Animals	Year 5 Materials	Year 5 Earth and Space	Year 5 Animals inc Humans
	Plants (planning for growing seeds and bulbs outside)	Plants (planning for growing seeds and bulbs outside)	Plants (planning for growing seeds and bulbs outside)			(Year 3 and 4 objectives)	Year 6 Electricity	<b>Year 6</b> Living Things and their Habitats	Year 6 Animals inc Humans
Science Term 2	Uses of everyday materials	Animals including humans	Living Things and their Habitats	Electricity	Living things and their habitats		Year 5 Forces Year 6 Light	Year 5 Evolution and Inheritance Year 6 Living Things and their Habitats	Year 5 Important people in Science woven throughout Year 6 Important people in Science woven throughout

# Cycle 2

YEAR	Year 1 / Year 2		Year 3 / Year 4		Year 5 / Year 6				
GROUP									
TERM	AUTUMN	SPRING	SUMMER	AUTUMN	SPRING	SUMMER	AUTUMN	SPRING	SUMMER
Science	Changing	Changing	Changing					Year 5	Year 5
Term 1	Seasons (Geog	Seasons (Geog	Seasons (Geog	Forces and	Plants	Living Things and		Earth and Space	Animals inc
	and Science)	and Science)	and Science)	Magnets		Their Habitats			Humans
							Year 6	Year 6	Year 6
	Plants	Plants	Plants				Electricity	Living Things and	Animals inc
	(planning for	(planning for	(planning for					their Habitats	Humans

	growing seeds and bulbs outside)	growing seeds and bulbs outside)	growing seeds and bulbs outside)		Light	<b>Year 5</b> Materials		
Science				Rocks		Year 5	Year 5	Year 5
Term 2	Uses of	Animals	Living Things			Forces	Evolution and	Important people
	everyday	including	and their				Inheritance	in Science woven
	materials	humans	Habitats					throughout
						Year 6	Year 6	Year 6
						Light	Living Things and	Important people
							their Habitats	in Science woven
								throughout

#### **EYFS Overview**

#### National Curriculum:

# ELG: The Natural World Children at the expected level of development will:

Children will have learnt in EYFS:

- To know that we need to care for living things
- To name several common animals (pets, farm animals) and plants (flower, tree)
- To know that animals move in different ways (imitate)
- Develop an understanding of growth, decay and changes over time
- To know the effect activity has on our body
- To manage to wash and dry hands.
- To know that humans and animals may have similarities, and differences.
- To know that animals may have different numbers of body parts using the language of more/less/fewer.
- To know that some materials are natural.
- To know the characteristics of solids and liquids.
- To know similarities and differences in some materials used within the setting.
- To know some basic properties of objects/materials.
- To know that plants grow and decay.
- To know some similarities and differences of plants.
- To talk about the different weathers.
- To recognise the different weather types for the four seasons.

#### **Key Vocabulary:**

Look closely, observe, watch, touch, feel, smell, listen, same, different, compare, ask questions, record, sort, group

# Next Steps in Learning at KS1:

# Children will build on their learning in EYFS by:

- The names of different animals around the world and what helps them thrive.
- Materials make objects and know some materials can be used for different purposes.
- How habitats help living things to survive.
- Know there are different types of plants and how they grow and survive.
- Explain what the four different seasons are like

## **Assessment:**

- The children will be able to speak about animals they have encountered.
- They will be able to talk about some of their bodies and other animals body parts on a basic level.
- They will be able to name some common garden plants.
- They will have be able to talk about what happens when they pour water and other liquids
- They can spot some solids that don't pour.
- Can say what the weather is like that day.

# EYFS MTP Substantive knowledge

Торіс	Nursery	Reception
Animals, excluding humans	<ul> <li>Learn about the life cycles of animals</li> <li>Compare adult animals to their babies</li> <li>Observe how baby animals change over time</li> </ul>	<ul> <li>Name and describe animals that live in different habitats.</li> <li>Describe different habitats</li> </ul>
Humans	<ul> <li>Learn about the life cycles of humans</li> <li>Learn about how to take care of themselves</li> <li>Learn about their senses</li> </ul>	<ul> <li>Describe people who are familiar to them</li> <li>Learn about how to take care of themselves</li> </ul>
Living things and their habitats	<ul> <li>Explore the surrounding natural environment</li> <li>Explore natural objects from the surrounding environment</li> </ul>	<ul> <li>Explore the plants in the surrounding natural environment</li> <li>Explore the animals in the surrounding natural environment</li> <li>Explore plants and animals in a contrasting natural environment</li> </ul>
Plants	Grow plants	
Seasonal changes		<ul> <li>Play and explore outside in all seasons and in different weather</li> <li>Observe living things throughout the year</li> </ul>
Materials, including changing materials	<ul> <li>Explore a range of materials</li> <li>Shape and join materials</li> <li>Combine and mix ingredients</li> <li>Change materials by heating and cooling, including cooking</li> </ul>	<ul> <li>Explore a range of materials, including natural materials</li> <li>Make objects from different materials, including natural materials</li> <li>Observe, measure and record how materials change when heated and cooled</li> <li>Compare how materials change over time and in different conditions</li> </ul>
Electricity	<ul><li>Identify electrical devices</li><li>Use battery-powered devices</li></ul>	
Light	<ul><li>Explore light sources</li><li>Shine light on or through different materials</li></ul>	<ul><li>Explore shadows</li><li>Explore rainbows</li></ul>
Forces	<ul> <li>Feel forces</li> <li>Explore how things work</li> <li>Explore how objects/materials are affected by forces</li> </ul>	<ul> <li>Explore how to change how things work</li> <li>Explore how the wind can move objects</li> <li>Explore how objects move in water</li> </ul>
Sound	<ul><li>Listen to sounds</li><li>Make sounds</li></ul>	<ul><li>Listen to sounds outside and identify the source</li><li>Make sounds</li></ul>
Earth and space		<ul> <li>Learn about the Earth, Sun, Moon, planets and stars</li> <li>Learn about space travel</li> </ul>

# EYFS Disciplinary knowledge

EYFS	How?	What do we want them to know?	KS1
	Working Sci	entifically Skills	
Show curiosity and	Getting children to ask questions.	What a question is.	Asking simple questions and
ask questions.	Understanding what a question is.	How to answer a question.	recognising they can be answered
	Being able to answer a question.	How to start a question.	in different ways.
	Know vocabulary to start a question.	To relate the question to the	
	Using question starts (How? Why?)	subject. (vice versa)	
	Modelling questions.		
	Adult interaction when around concrete		
	objects.		
	Asking why things happen.		
	Asking what happens if?		
Make observations	Describe what they can see, hear and feel.	What senses are (exposure).	Observe closely using simple
using their senses and	Exposure to opportunities to use different	Be able to say what they can see.	equipment.
simple equipment.	senses.	Be able to start to recognise links.	Using observations and ideas to
	Say what they see.	How to use simple equipment.	suggest answers to questions.
	Make comments on what they have heard.	Talk through their actions (e.g.	Performing simple tests.
	Using magnifying glasses, cups/ jugs,	pouring water)	
	Give opinions.	Describe their immediate	
		environment.	
		To be able to choose the	
		appropriate tools to complete a job.	
Make direct	Recognise some environments are different	To know opposites. (e.g. light/ dark,	Asking simple questions and
comparisons	to the one in which they live.	hot/cold, soft/hard)	recognising they can be answered
	Know about contrasting environments.	To notice a change.	in different ways.
	Make statements about differences.	To notice differences in size.	Identifying and classifying
	Know how some things are similar and know	To know that environments can be	
	that there are differences too.	different.	
		To use the phrases they have	
		more/less/ same.	
Identify, sort and	Begin to make links to other areas of the	Т	Identifying and classifying
group	world around them.		
	Group similar objects.		

Record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets	Talk about how things can be the same and different. Pick out objects based on simple properties (size, colour, texture) Organise items into groups. Draw something that they can see and talk about what it is. Record as a class in different ways. Make choices of what they photograph. Talk about how things are different over time (animal changes, seasons etc) Compare quantities.	Talk about what they have observed. To be able to choose the most appropriate subject to record. To use the phrases, they have more/less/ same.	Gathering and recording data to help in answering questions. Observing closely, using simple equipment. Performing simple tests.
have done, found out	Talk about what has been done.	happened in a sequence.	ideas to suggest answers to
and what might	Place events in order.	To be able to use the words, first,	questions.
happen.	Give thoughts about what might happen.	next, then etc. To recognise that they have found something out. To make a simple prediction.	Gathering and recording data to help in answering questions.
	Season	al changes	
Play and explore	Seasonal walks.	To know different types of weather.	Observe changes across all four
outside in all seasons	Model vocabulary when discussing the	To know the names of the seasons.	seasons.
and in different	weather.	To know a shadow is created by the	Observe and describe the
weather.	Talk about what is needed to access the	sun.	weather associated with the
	outdoor environment (e.g. put wellies on in	To describe how mornings are	seasons and how day length
	the rain, sun cream on a hot day)	anterent throughout the year.	varies.
	Explore different outside environments	different in different weathers	
	(Deyond the school)	Te know kowyoeebwlery essecieted	
	polar bears to snow)	to weather and senses.	
	, ,		

Observe living things throughout the year.	Understand what a living thing is. Discuss differences in animals throughout the year. (e.g. when do you see bees, wasps, butterflies etc) Understand some important changes in the natural world around them.		To describe how a leaf looks different in each season. To know what a living thing is. To know that some animals appear different at times of year (e.g. lambs in spring) To know that some animals hibernate. To know what hibernation is.	
		Mat	terials	
Explore a range of mate including natural materi Make objects from diffe materials, including natu materials.	rials, als. arent ural	Name specific materials (wood, paper, metal, plastic, water, rock and glass.) Sort and group objects by the type of material. To name familiar everyday objects. Explore natural objects in the environment. Make an object by choosing materials (including natural materials). Explore a range of materials within the classroom and different environments.	Names of simple materials (wood, paper, metal, plastic, rock, water and glass). Names of common objects. Understand some materials come from the natural world.	Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock.
Observe and record hov change when heated an	v materials d cooled.	Describe an object using senses. Use simple adjectives to describe (soft/hard, hot/cold).	Know some simple properties – size, texture (hard/soft/ rough/smooth).	Describe the simple physical properties of a variety of everyday materials.

		Identify come mean with a of a	
	Explore now some objects change	identity some properties of a	
	with temperature e.g. water and	given object.	
	chocolate.		
	Describe what happens when		
	something is heated or cooled.		
Compare how materials change	Group objects by sorting them	Group objects by a material.	Compare and group together a
over time and in different	into a material.	Name the material they have	variety of everyday materials on
conditions.	Observe a material over time (e.g.	grouped objects by.	the basis of their simple physical
	ice, a natural object).	Choose a material for a purpose	properties.
	Observe a material in different	based on their simple properties.	
	conditions (e.g. inside/outside,	Say why they made this choice.	
	seasons).		
	Animals, incl	uding humans	
To describe the main body parts of	Singing songs with body parts.	To know the basic body parts	Identify, name, draw and label the
familiar humans	Pointing to body parts on	(head, shoulders, arms, legs,	basic parts of the human body and
To describe some familiar humans	themselves and their friends.	hands, feet, toes, fingers)	say which part of the body is
	Matching pictures to the body	To identify boys, girls and	associated with each sense
	part.	immediate family members.	
	Describe some simple similarities		
	and differences between them		
To know how to take care of	Talking about how they look after	How to wash their hands	
themselves	their own health and hygiene	How to brush their teeth	(Yr 2) Find out and describe the
	Noticing when they feel hot and	To choose healthy food ontions	hasic needs of animals including
	cold and how to respond to this	To know why we drink out	humans for survival (water food
	Choosing appropriate materials to	oversise and sleep - to keep	and air)
	choosing appropriate materials to	exercise and sleep - to keep	
	protect themselves from the sun	Te know when to go to the toilet	()/r 2) Deseribe the immentence for
		To know when to go to the tollet.	(Yr 2) Describe the importance for
		To choose appropriate items for	numans of exercise, eating the
		the sun (nats, sunglasses)	right amounts of different types of
		To remove clothing (jumper, coat)	food, and hygiene.
		when hot or add clothing (scarf,	
		gloves)	
To know their senses	Show songs	To know feel, touch, see, smell,	Identify, name, draw and label the
	Use the senses (hands, eye, ears,	taste.	parts of the human body and say
	mouth and nose)		

Name and describe animals	Pictures – matching activities Observe farm animals (possible trip)	To describe in simple form their senses. To say which part of the body is used to smell, taste, hear, see and touch. To know the names of farm animals	which part of the body is associated Describe and compare the structure of a variety of common animals (fish amphibians contiles
	Sort animals into groups. Identify the basic body parts on given animals.	To be able to group animals as similar (e,g dogs – all different breeds are still dogs)	birds and mammals, including pets
		To use basic names for animal body parts eg fur, beak, scales, class, tail, snout	common animals including fish, amphibians, reptiles
	Pla	nts	
Explore collections of materials with similar and/or different properties. Use all their senses in hands-on exploration of natural materials.	Identifying and observing different plants and trees. Talking about similarities and differences between different plants and trees. Exploring the plants and trees in the local environment. Exploring the plants and trees in contrasting environments. Drawing simple plants and trees they have seen.	To identify a plant. To identify a flower. To identify a tree. To know the names of common flowers, trees, plants.	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
Begin to understand the need to respect and care for the natural environment and all living things. Understand the key features of the life cycle of a plant.	<ul> <li>Planting and caring for a seed.</li> <li>Comparing seeds and bulbs.</li> <li>Observing what happens to plants over time (when cared for and when left).</li> <li>Observe what happens to fruit and vegetables when they decay.</li> </ul>	To talk about basic parts (leaf, flower etc). To know what a seed is. To know what a plant needs to grow (sun and water). To know that fruits and vegetables come from plants.	Identify and describe the basic structure of a variety of common flowering plants, including trees.

Plant seeds and care for growing	Talking about different parts of a		
plants.	plant and tree and what they look		
	like.		
	Using appropriate tools and		
	equipment to care for plants.		
	Living things and th	eir habitats (Year 2)	
Explore the plants in the	Explore the natural world around	To be able to talk about why	Explore and compare the
surrounding natural environment.	them.	plants grow in certain places.	differences between things that
	Draw upon own experiences.	To be able to talk about what they	are living, dead and never been
	Understand some important	can see around them.	alive.
	processes and changes in the	To be able to draw a plant.	Identify and name a variety of
	natural world around them.		plants and animals in their
			habitats including micro-habitats.
Explore the animals in the		To be able to talk about animals	
surrounding natural environment.		they would find in the school	
		environment (e.g worms,	
		woodlice etc)	
		To be able to talk about what they	
		can see around them.	
		To be able to draw an animal.	
Explore plants and animals in a	Know similarities and differences	To be able to talk about which	Identify that most living things live
contrasting natural environment.	in the natural world.	animals would live in different	in habitats to which they are
	Explain some differences between	environments (e.g. polar bears	suited and describe how different
	life in this country and life in other	and snow)	habitats provide for the basic
	countries.	To be able to talk about	needs of different kinds of animals
	Recognise that some	differences between places.	and plants and how they depend
	environments are different to the	To be able to talk about where	on each other.
	one they live in.	they live.	Describe how animals obtain their
			food from plants and other
			animals, using the idea of a simple
			food chain and identify and name
			simple sources of food.

#### **KS1** Overview

National Curriculum Content:

- To know the names of a variety of animals and their groups (fish, amphibians, reptiles, birds and mammals)
- To know the difference between the different animal groups
- To know the difference between carnivores, herbivores, omnivores
- To know the features of different animals (body parts)
- To know the difference between the features of different animals (body parts)
- To know the names of different body parts and the names of the senses.
- To know that animals (including humans) have offspring which grow into adults e.g. kittens into cats, puppies into dogs, babies into adults
- To know the basic needs of animals (including humans) e.g. food, water, air
- To know the importance for humans of exercise, eating the right amounts of different food and hygiene. ٠
- To know differences between an object and the material from which it is made.
- To know and name a variety of materials:
- Wood, plastic, glass, metal, water, rock
- To know some simple physical properties of a variety of materials. •
- To know how some materials have different properties to others.
- To know that some materials are more suitable than others for specific uses.
- To know how the shape of some solid objects can be changed in different ways.
- To know the differences between things that are living, dead and things that have been alive.
- To know that most living things live in habitats to which they are situated.
- To know that different kinds of animals and plants depend on each other.
- To know and name a variety of plants and animals in their habitats including microhabitats. ٠
- To know how animals obtain their food from plants and other animals, using the idea of a simple food chain and identify and name different sources of food.
- To know a variety of common, wild and garden plants including deciduous and evergreen trees
- To know the basic structure of a variety of common flowering plants including trees.
- To know how seeds and bulbs grow into mature plants
- To know why plants need water, light and a suitable temperature to grow and stay healthy.
- To know the changes across the four seasons.
- To know which weather types are associated with the seasons and how the length of 'day' changes.
- To know how plants change across the four seasons and how some do not appear to change.

# **Key Vocabulary:**

observe, changes, patterns, grouping, sorting, compare, same, different, identify (name), measure, data, record results, drawing, picture, table, tally chart, present, pictogram, block chart, Venn diagram, ask questions, test, investigate, explore, equipment, resources, magnifying glass, hand lens, ruler, tape measure, metre stick, pipette, syringe, spoon, teaspoon, answer questions, interpret results, scientific enquiry, pattern seeking, comparative testing, observing over time, classifying, researching using secondary sources

#### **Prior Learning:**

# Children will have learnt in EYFS:

- basic level.
- They will be able to name some common garden plants. •
- liquids
- They can spot some solids that don't pour.
- Can say what the weather is like that day.

# Next Steps in Learning: Children will build on their learning in LKS2 by:

- Explain why electric appliances work.
- Decide whether an object only have one state.
- Explain what makes something move.
- Identify the similarities and differences between rocks and soils.
- Know where light and dark come from.
- Explain why vibrations are so important in relation to sound.
- Describe why animals, including humans, can move around.
- Name what animals, including humans, eat and how they do it.

# Assessment:

By the end of KS1 children should know:

- purposes.
- How habitats help living things to survive.
- Know there are different types of plants and how they grow and survive.
- Explain what the four different seasons are like

 The children will be able to speak about animals they have encountered. They will be able to talk about some of their bodies and other animals body parts on a

• They will have be able to talk about what happens when they pour water and other

 The names of different animals around the world and what helps them thrive. • Materials make objects and know some materials can be used for different

### Science Year 1 and 2 MTP-

Theme:	Animals Including Humans	
		FINAL OUTCOME/ ASSESSMENT OPPORTUNITY
PRIOR KNOWLEDGE	k	(What all children will be able to talk about by the end of the unit) Key question: What different animals are there in the world and what helps them thrive?
Links to 30 - 50 months Understanding the world To know that we need to care for I To name several common animals (flower, tree) To know that animals move in diffe Develop an understanding of grow Physical Development – Health and To know the effect activity has on o To manage to wash and dry hands. Links to 40 - 60 months Understanding the world To know that humans and animals differences. To know that animals may have dif the language of more/less/fewer.	iving things (pets, farm animals) and plants erent ways (imitate) th, decay and changes over time <u>d self-care</u> our body may have similarities, and fferent numbers of body parts using	Links to Y3 Animals Inc Humans: To know that animals (including humans) need the right types and amount of nutrition and that they car they eat. To know that humans and some animals have skeletons and muscles for support and movement. Links to Y4 Animals Inc Humans: To know the simple functions of the basic parts of the digestion system in humans To know the different types of teeth in humans (and other animals) and their simple functions. To know the different types of teeth in humans (and other animals) and their simple functions. To know a variety of food chains and how the energy flows through a food chain To know how to correctly draw a food chain. To know some producers, predators and prey. Links to Y5 Animals Inc Humans: To know the changes as humans develop into old age To know the gestation period of other animals and humans Links to Y6 Animals Inc Humans: To know the main parts of the human circulatory system, and the functions of the heart, blood vessels a To know the impact of diet, exercise, drugs and lifestyle on the ways their bodies function. To know the ways in which nutrients and water is transported

# **CURRICULUM LINKS:**

#### Y1 Knowledge

- To know the names of a variety of animals and their groups (fish, amphibians, reptiles, birds and mammals)
- To know the difference between the different animal groups
- To know the difference between carnivores, herbivores, omnivores
- To know the features of different animals (body parts)
- To know the difference between the features of different animals (body parts)
- To know the names of different body parts and the names of the senses

# **Enquiry Skills**

- Identifying and classifying. This could be achieved by grouping animals according to diet e.g. Carnivores, omnivores, herbivores. (Grouping and Classifying)
- Asking simple questions. This could be achieved by choosing an animal and the children generating questions about that animal. (Grouping and classifying)

# Y2 Knowledge

- To know that animals (including humans) have offspring which grow into adults e.g. kittens into cats, puppies into dogs, babies into adults
- To know the basic needs of animals (including humans) e.g. food, water, air
- To know the importance for humans of exercise, eating the right amounts of different food and hygiene.

# **Enquiry Skills**



and blood.

Using their observations and ideas to suggest answers to questions. This could be achieved by answering questions about what animals need to survive and what humans need to stay healthy. This could be achieved by answering questions about growth of animals and humans. This could be achieved by observing the importance of hygiene using a light box to check hand washing/paint on hands. (Pattern Seeking/Research)

# HOOK:

Different animals around the room. How would the children group them? Can you name them? Why have you grouped them in that way? Can they find all the birds, mammals etc. How do they know? Work in groups to explain and share ideas.

# Vocabulary:

Amphibians, Reptiles, Mammals, Carnivores, Herbivores, Omnivores, Gills, Claws, Hooves, More advance human body parts; Ankle, Elbow, Hips, Shoulder, Knee, Habitat, Offspring, Adult, Reproduction, Water, Air, Survival, Mouth, Tongue, Teeth, Exercise, Diet, Hygiene, Nutrition, Growth, Eat, Food

# **SMALL STEPS IN LEARNING:**

# Y1

- What are the different groups of animals called? (fish, amphibians, reptiles, birds and mammals) (Enquiry based Grouping and classifying)
- What are the differences between the different animal groups? (Enquiry based Asking simple questions. This could be achieved by choosing an animal and the children generating questions about that animal. (Grouping and classifying))
- How are carnivores, herbivores, omnivores different from each other? (Enquiry based Identifying and classifying. This could be achieved by grouping animals according to diet e.g. Carnivores, omnivores, herbivores. (Grouping) and Classifying))
- What are the features of different animals called? (body parts Grouping and classifying/secondary sources)
- ٠ What are the differences between the features of different animals? (body parts - Grouping and classifying)
- What are humans body parts called and what senses do they have? (secondary sources) •

# Y2

- Do all animals, including humans, have offspring? (secondary sources) •
- Are all offspring called babies? (secondary sources/Identifying, grouping and classifying)
- What are the different stages of a human lifecycle called? (PSHE Link- secondary sources)
- Do humans get faster as they grow older? (PSHE Link) (Enquiry based comparing time taken to run distance over playground across year groups (Pattern Seeking)). •
- What are basic needs of animals, including humans, which help them stay alive? (secondary sources)
- Is it important that humans eat a varied diet? (secondary sources) •
- How does exercise keep our bodies healthy? (secondary sources) ٠
- Why is good hygiene so vital to keeping ourselves healthy? (secondary sources) •
- What is the best method of washing our hands to get rid of the most germs? (Using their observations and ideas to suggest answers to questions. This could be achieved by observing the importance of hygiene using a light box to check hand washing/paint on hands. Glitter bug experiment (Pattern Seeking/comparative testing)).

Theme:	Everyday Materials
	FINAL OUTCOME/ ASSESSMENT OPPORTUNITY
	(What all children will be able to talk about by the end of the unit) Key question: What are objects made of and can any material be used for any purpose?
PRIOR KNOWLEDGE	NEXT STEPS:
	Links to Y3 Magnets
Links to 30 - 50 months	To know that some materials are magnetic and non-magnetic.
Mathematics: Shape, space and measure	To know that most metals are magnetic.
To know that some materials are natural.	Links to Y4 States of matter
Understanding the World	To know that some materials are solids, liquids and gases.
To know the characteristics of solids and liquids.	To know that some materials can change state.
<u>Links to 40 - 60 months</u>	Electricity
Understanding the World	To know which materials are better conductors of electricity (metals).
Understanding the World: The World	Links to Y5 Properties and Changes of Materials
To know similarities and differences in some materials used	To know the similarities and differences between everyday objects and be able to group them based on their pro
within the setting.	To know that some materials are more suitable for particular uses than others based on testing and conclusions.
To know some basic properties of objects/materials.	Links to Y6 Light
	To know which materials are better reflectors of light.

# **CURRICULUM LINKS:**

#### Y1 Knowledge

- To know differences between an object and the material from which it is made.
- To know and name a variety of materials: •
- Wood, plastic, glass, metal, water, rock
- To know some simple physical properties of a variety of materials.
- To know how some materials have different properties to others.

# **Enguiry Skills**

- Using their observations and ideas to suggest answers to questions. This could be achieved by exploring objects that are always made out of the same material. E.g. Window made from glass.
- Identifying and classifying. This could be achieved by naming and sorting materials on the basis of their physical properties. (Grouping and classifying)
- Perform simple tests. This could be achieved by name and property. Simple tests could be performed according to their property e.g. testing waterproof/absorbent. e.g an umbrella. A final test could be performed to choose an appropriate material for a task based on a property. (Comparative testing)

# Y2 Knowledge

- To know that some materials are more suitable than others for specific uses.
- To know how the shape of some solid objects can be changed in different ways.

# **Enquiry Skills**

- Gathering and recording data to help in answering questions. This could be achieved by completing a table looking at how materials can be changed. Does it bend? Does it squash? Does it twist? Does it stretch? (Grouping and classifying).
- Perform simple tests. This could be achieved by investigating the suitability of a material based on multiple properties. Bendy, waterproof and strong. E.g. a cover for a picnic basket. (Comparative testing). -

operties and results of testing.

# HOOK:

Initial hook – Using post it notes, children name objects around the classroom. Can they describe some objects that you bring in in a mystery bag? Drawing out vocabulary. Picture of a new chocolate teapot that I've bought/raincoat made of paper etc. Do they think I've made a good purchase? What is wrong with them?

#### Vocabulary:

Wood, Plastic, Glass, Paper, Metal, Rock, Water, Properties, Material, Hard, Soft, Bendy, Rough, Smooth, Waterproof, Absorbent, Opaque, Transparent, Brick, Fabric, Elastic, Foil, Cardboard, Stretchy, Stiff, Shiny, Dull, Squash, Twisty, stretchy

#### **SMALL STEPS IN LEARNING:**

Y1

- Is an object named after what it is made from? (Secondary sources). ٠
- What are the names of some common materials? (Secondary sources/Identifying, Grouping and classifying) ٠
- What objects are made from wood, plastic, glass, metal, or rock? (Enquiry based Naming and sorting materials on the basis of their physical properties. (Grouping and classifying)).
- What are the physical properties of a variety of materials? (Comparative testing)
- Why are some objects always made from the same materials? (Enquiry based Exploring objects that are always made out of the same material. E.g. Window made from glass and asking questions about why that is. (Grouping and classifying/pattern seeking)).
- Do all materials have the same properties? (Enquiry based Simple tests could be performed according to their property e.g. testing waterproof/absorbent. e.g an umbrella. A final test could be performed to choose an appropriate material for a task based on a property. (Comparative testing)).

Y2

- What are different uses of everyday materials? (Secondary sources/Identifying, Grouping and classifying) •
- What makes some materials suitable for their use? (Comparative testing/ Identifying, Grouping and classifying/ Secondary sources)
- How do materials change compared to each other and how would this make them suitable for a purpose? (Enquiry based completing a table looking at how materials can be changed. Does it bend? Does it squash? Does • it twist? Does it stretch? (Grouping and classifying/Comparative)).
- What material would make the best mop head? Enquiry based This could be achieved by investigating the suitability of a material based on multiple properties. Bendy, waterproof and strong. E.g. a cover for a picnic basket. (Comparative testing)).

# **IMPORTANT PEOPLE IN SCIENCE:**

- Chester Greenwood (Inventor of earmuffs)
- Charles Macintosh links to free resources requiring a login (Chemist and inventor of waterproof clothing) •
- Victoria Callaghan (Develops sustainable packaging for BASF plc)
- Dr Pearl Agyakwa (Materials scientist who studies why some materials wear out and other don't)

Theme:	Living Things and Their Habitats
	FINAL OUTCOME/ ASSESSMENT OPPORTUNITY
	(What all children will be able to talk about by the end of the unit) Key question: How do habitats help living things to survive?
PRIOR KNOWLEDGE	NEXT STEPS:
Links to Y1 Animals, including humans To know carnivore, herbivores and omnivores and understand that they eat different things. To know what a habitat is (local environment). To know what their local habitat is (Different habitats?) To know specific environments of plants and animals.	Links to Y3 Plants To know types of plants – flowering vs non flowering <u>Animals inc Humans</u> To know some animals are vertebrates while others invertebrates <u>Links to Y4 Living Things and Their Habitats</u> To know key characteristics of plants and animals. To know different ways to group living things e.g. mammals etc, evergreen etc. To know a variety of living things in their local and wider environment. To know that environments can change and that this can sometimes pose dangers to living things. <u>Links to Y5 Living Things and Their Habitats</u> To know the differences in the life cycles of a mammal, amphibian, insect and a bird. To know the life process of reproduction in some plants and animals. <u>Links to Y6 Living Things and Their Habitats</u> To know a range of observable characteristics of animals, microorganisms and plants. To give reasons for classifying plants, animals and microorganisms based on specific characteristics.

## **CURRICULUM LINKS:**

Knowledge

- To know the differences between things that are living, dead and things that have been alive.
- To know that most living things live in habitats to which they are situated.
- To know that different kinds of animals and plants depend on each other.
- To know and name a variety of plants and animals in their habitats including microhabitats.
- To know how animals obtain their food from plants and other animals, using the idea of a simple food chain and identify and name different sources of food.

#### **Enquiry Skills**

- Identifying and classifying. This could be achieved by exploring, classifying and comparing the differences between things that are 'alive', 'dead', or 'never alive'. (Grouping and classifying).
- Using their observations and ideas to suggest answers to questions. This could be achieved by designing a habitat for an animal based on their observations of habitats and the animals needs. (Researching using secondary resources-researching which animals live in a habitat).
- Observing closely, using simple equipment. This could be achieved by using a magnifying glass to look at a small area of a habitat. e.g. school field. (Pattern seeking-any features that animals have the same within a habitat).

# HOOK:

Initial hook – can you match animals to their habitats? Lots of photos and different habitats. Habitats at different times of the year – can they match them up?

# Vocabulary:

Habitat, Food chain, Deciduous, Evergreen, Predator, Prey

#### SMALL STEPS IN LEARNING:



- Is everything alive at some point? (Enquiry based Identifying and classifying. This could be achieved by exploring, classifying and comparing the differences between things that are 'alive', 'dead', or 'never alive'. (Grouping and classifying))
- Are all habitats the same? (Enquiry based research habitats and what animals live there (Researching using secondary resources))
- How is a microhabitat different from other habitats? (Enquiry based Observing closely, using simple equipment. This could be achieved by using a magnifying glass to look at a small area of a habitat. e.g. school field. • (Pattern seeking-any features that animals have the same within a habitat).
- Do all habitats contain the same living things? (Enquiry based Using their observations and ideas to suggest answers to questions. This could be achieved by designing a habitat for an animal based on their observations • of habitats and the animals needs. (Enquiry based - Researching using secondary resources-researching which animals live in a habitat).
- How do different kinds of animals and plants depend on each other? (Split into two parts how habitats provide shelter and what food chains are (secondary sources) ٠

# **IMPORTANT PEOPLE IN SCIENCE:**

- William Kirby (Father of modern entomology, the study of insects)
- Prem Singh Gill (Polar Scientist who studies where Antarctic seals live, breed and feed, so we can know more about where they prefer to live) ٠
- Dawood Qureshi (Marine Biologist who studies wildlife in the ocean) ٠

Theme:	Plants
	FINAL OUTCOME/ ASSESSMENT OPPORTUNITY
	(What all children will be able to talk about by the end of the unit)
	Key question: What different types of plants are there and how do they grow and survive?
PRIOR KNOWLEDGE	NEXT STEPS:
Links to 30 - 50 months Understanding the World To know that plants grow and decay. Links to 40 - 60 months Understanding the World To know some similarities and differences of plants.	Links to Y3 Plants:To know the functions of different parts of flowering plants.To know the requirements of plants, the life and growth and how they vary from plant to plant.To know the requirements of plants, the life and growth and how they vary from plant to plant.To know the way in which water is transported in plantsTo know the part that flowers play in the lifecycle of plantsLinks to Y4 Living thingsTo know how to use classification keys to help group, identify and name a variety of living things.Links to Y5 Living thingsTo know the life process of reproduction in some plantsEarth and SpaceTo know how living things are classified into broad groups.To know how living things are classified into broad groups.To know the reasons for classifying plants based on specific characteristicsEvolution and InheritanceTo know how plants are adapted to suit their environment.

# **CURRICULUM LINKS:**

#### Y1 Knowledge

- To know a variety of common, wild and garden plants including deciduous and evergreen trees
- To know the basic structure of a variety of common flowering plants including trees. •

# Enquiry Skills

- Observing closely, using simple equipment. This could be achieved by identifying plants and trees e.g. names of plants, names of plant parts. This could be achieved by identifying trees by their leaves. This could be achieved by using a magnifying glass to observe different leaf buds and how the leaf bud develops over time. (Grouping and classifying / Observation over time)

# Y2 Knowledge

- To know how seeds and bulbs grow into mature plants
- To know why plants need water, light and a suitable temperature to grow and stay healthy.

#### **Enquiry Skills**

- Perform simple tests. This could be achieved by observing plants at different stages of its growth during a simple test. This could be achieved by setting up a comparative experiment to conclude the best conditions for plant growth. (Observation over time and comparative testing).
- Gathering and recording data to help in answering questions. This could be achieved by measuring the height of plant as it grows. (Observation over time and comparative testing).
- Asking simple questions and recognising they can be answered in different ways. This could be achieved by looking at how much light or water a plant needs to grow. Where does a plant grow best? Children to suggest ways of answering. E.g. child 1-outside, child 2 –on the windowsill. As a starting point look at questions that can be answered and questions that can't be. (Observation over time and comparative testing).

# HOOK

Bring in a bunch of flowers/potted plants. Discuss how you got them from the shop, is there anywhere else you could have acquired them? Draw from the children that the flowers would have been picked from the wild/garden to create the bunch. Can they name any of the flowers/plants? Are they the only type of plants (draw in the knowledge that a tree is a plant).

Bring in a pack of seeds/bulbs and put them on the table. Explain that they had been in the plastic pot for a while and I thought they would have been plants by now – can they help me? Do they know why they haven't grown?

# Vocabulary:

Deciduous, Evergreen, Stem, Leaves, Roots, Soil, Petal, Trunk, Branches, Flower, Seed/bulb, Compost, Blossom, Names of plants and trees, Seedlings, Shoot, Temperature, Bud, Germination, Reproduction, Nutrients, Conditions, observation, diagram.

## **SMALL STEPS IN LEARNING:**

Y1

- What are the names of some wild plants called? (Enquiry based To gather and record data to help in answering questions. This could be achieved by finding out which wild plant is the most common. (Pattern seeking/grouping and classifying)).
- What are the names of some garden plants? (Secondary sources)
- What are the parts of a common flowering plant called? (Enquiry based Observing closely, using simple equipment. This could be achieved by identifying plants and trees parts, by going out to look at a tree and by ٠ naming plant parts after looking at them with a magnifying glass and dissecting them (Grouping and Classifying)).
- What is the difference between deciduous and evergreen trees? (Enquiry based Observing closely, using simple equipment. This could be achieved by identifying trees by their leaves. This could be achieved by using a magnifying glass to observe different leaf buds and how the leaf bud develops over time. (Grouping and classifying / Observation over time)).

Y2

- What is the lifecycle of a plant? (Observing over time/secondary sources could be done through time lapse video)
- What does a seed and bulb need to germinate? (Enquiry based Perform simple tests. This could be achieved by observing plants at different stages of its growth during a simple test. This could be achieved by setting up a comparative experiment to conclude the best conditions for plant growth using seeds and bulbs. (Observation over time and comparative testing)).
- What are the best conditions for a plant to grow? (Enquiry based Asking simple questions and recognising they can be answered in different ways. This could be achieved by looking at how much light or water a plant needs to grow. Where does a plant grow best? Children to suggest ways of answering. E.g. child 1-outside, child 2 - on the windowsill. As a starting point look at questions that can be answered and questions that can't be. (Observation over time and comparative testing)).
- What do plants need to stay healthy? (Enquiry based Gathering and recording data to help in answering questions. This could be achieved by measuring the height of plant as it grows. (Observation over time and • comparative testing)).

# **IMPORTANT PEOPLE IN SCIENCE:**

- Maria Sibylla Merian (German artist, scientific illustrator, and naturalist)
- Angie Burnett (Plant Biologist who grows plants and sees how they react to different conditions that make it more difficult for them to grow)

Theme:	Seasonal Changes
	FINAL OUTCOME/ ASSESSMENT OPPORTUNITY
	(What all children will be able to talk about by the end of the unit)
	Key question: What are the four different seasons like?
PRIOR KNOWLEDGE	NEXT STEPS:
	Links to Y2 Living things and their habitats:
	To know that things generally live in habitats in which they are suited. Know why some birds migrate for winter.
	Materials:
	To know that different materials are more suitable during different seasons due to weather.
	Animals including humans:
<u>Links to 30 - 50 months</u>	To know about Spring and how many animals give birth during this season.
Understanding the World	Links to Y3 Light:
To talk about the different	To know that shadow lengths differ at the same time of day in different seasons.
weathers.	<u>Plants:</u>
<u>Links to 40 - 60 months</u>	To know that plants have different requirements for growth and as a result different plants grow differently in different seasons.
Understanding the World	Links to Y4 Living things and their habitats:
To recognise the different	To know that environments can change by the season and that this affects animal activity.
weather types for the four	States of matter:
seasons.	To know the role the weather/temperature can play in the water cycle. E.g. to know why we are most likely to have snow during winter.
	Links to Y5 Earth and space:
	To know of the Earth's rotation explains day and night.
	To know that the position of the Earth in its orbit around the sun and the Earth's tilt on its axis produces the seasons.
	Links to Y6 Evolution and inheritance:
	To know that animals have adapted to suit their environment and how this links to the seasons.
	E.g. animals shedding different coats due the seasons.

**CURRICULUM LINKS**:

# Knowledge

- To know the changes across the four seasons.
- To know which weather types are associated with the seasons and how the length of 'day' changes.
- To know how plants change across the four seasons and how some do not appear to change.

# **Enquiry Skills**

- Observing closely, using simple equipment. This could be achieved by observing that at different times of the year it is either lighter or darker when they get up and go to bed. This could be achieved by looking at \_ weather and plants across the seasons and identifying the changes. (Observations over time)
- Gathering and recording data to help in answering questions. This could be achieved by making a table or chart of rainfall or temperature, sunset and sunrise for length of day. E.g. pictogram (pattern seeking)

# **HOOK:**

Initial hook – Seasonal walks, inappropriate clothes for a walk (if it is raining that day, explain you will walk out without your coat/start putting on a thick, heavy coat if it is sunny) Ask the children if they think this is right to instigate discussion, interest and prior knowledge.

Vocabulary:

Autumn, Spring, Summer, Winter, Temperature, Frost, Storm, Shadows, Deciduous, evergreen, Sunburn, Frostbite

# **SMALL STEPS IN LEARNING:**

#### Autumn Term (1)

- How many seasons are there and what are they called? (Secondary Sources) ٠
- What is the environment normally like in Autumn? (Enquiry based Observing closely, using simple equipment. Taking photos on the environment around school. Will be used throughout the school year to compare and contrast (Observations over time)).
- What is the weather normally like in Autumn? (Enquiry based Gathering and recording data to help in answering questions. Charting rainfall (pattern seeking)). •
- How long are the days in Autumn? (Enquiry based Gathering and recording data to help in answering questions. Charting sunrise and sunset times (pattern seeking)).
- Why are some plants losing their leaves in Autumn? (Secondary sources)

# Autumn Term (2)/Spring Term (1)

- How has the environment changed now it is Winter? (Enquiry based Observing closely, using simple equipment. Taking photos on the environment around school. Will be used throughout the school year to compare and contrast (Observations over time)).
- How has the weather changed now it is Winter? (Enquiry based Gathering and recording data to help in answering questions. Charting rainfall (pattern seeking)).
- Are days longer or shorter now it is Winter? (Enquiry based Gathering and recording data to help in answering questions. Charting sunrise and sunset times (pattern seeking)).

# Spring Term (2)

- How has the environment changed now it is Spring? (Enquiry based Observing closely, using simple equipment. Taking photos on the environment around school. Will be used throughout the school year to compare and contrast (Observations over time)).
- How has the weather changed now it is Spring? (Enquiry based Gathering and recording data to help in answering questions. Charting rainfall (pattern seeking)).
- Are days longer or shorter now it is Spring? (Enquiry based Gathering and recording data to help in answering questions. Charting sunrise and sunset times (pattern seeking)).
- Why do some plants starting to get flowers and grow their leaves back now it is Spring? (Secondary sources)

# Summer Term (2)

- How has the environment changed now it is Summer? (Enquiry based Observing closely, using simple equipment. Taking photos on the environment around school. Will be used throughout the school year to compare and contrast (Observations over time)).
- How has the weather changed now it is Summer? (Enquiry based Gathering and recording data to help in answering questions. Charting rainfall (pattern seeking)).
- Are days longer or shorter now it is Summer? (Enquiry based Gathering and recording data to help in answering questions. Charting sunrise and sunset times (Secondary sources/Secondary sources)). ٠
- What are the similarities and differences between the four seasons? (Secondary sources what they have observed and identified as their secondary sources)

# **IMPORTANT PEOPLE IN SCIENCE:**

Jim Cantore (Meteorologist and storm tracker)
### **Science Year 3 and 4 Overview**

## National Curriculum Content:

- To know the names of common appliances that run on electricity
- To know what a circuit is
- To know the parts/components of a circuit
- To know what makes a circuit work
- To know how a switch works
- To know what conductors and insulators are
- To know if an object is a solid, liquid or gases.
- To know the difference between solids, liquids and gases.
- To know that some materials change state when heated. •
- To know the part played by evaporation and condensation in the water cycle.
- To know different kinds of rocks on the basis of their appearance and simple physical properties
- To know how fossils are formed when things that have lived are trapped within rock
- To know that soils are made from rocks and organic matter
- To know that light is needed in order to see things and that dark is the absence of light.
- To know that light is reflected from surfaces.
- To know that light from the sun can be dangerous and that there are ways to protect their eyes.
- To know that shadows are formed when the light source is blocked by a solid object.
- To know that there are patterns in the way that the size of shadows change.
- To know how sounds are made vibrating.
- To know that vibrations need a medium to travel through to get to the ear.
- To know that different objects can produce a different pitch.
- To know that 'stronger' vibrations produce greater volume.
- To know that sound gets fainter as the distance from the source increases.
- To know that animals (including humans) need the right types and amount of nutrition and that they cannot make their own food; nutrition comes from what they eat.
- To know that humans and some animals have skeletons and muscles for support and movement.
- To know the simple functions of the basic parts of the digestion system in humans
- To know the different types of teeth in humans (and other animals) and their simple functions.
- To know a variety of food chains and how the energy flows through a food chain
- To know how to correctly draw a food chain
- To know some producers, predators and prey

### **Key Vocabulary:**

practical work, fair testing, relationships, accurate, thermometer, data logger, stopwatch, timer, estimate, data, diagram, identification key, chart, bar chart, prediction, similarity, difference, evidence, information, findings, criteria, values, properties, characteristics, conclusion, explanation, reason, evaluate, improve

## **Prior Learning:**

# Children will have learnt in EYFS/KS1:

- thrive.
- purposes.
- How habitats help living things to survive.
- Explain what the four different seasons are like

## Next Steps in Learning: Children will build on their learning in UKS2 by:

- made.
- Explain what happens during a human's life cycle.
- Identify if all life cycles the same.
- survival.
- Identify how living things can be classified.

### Assessment:

By the end of LKS2 children should:

- Explain why electric appliances work.
- Decide whether an object only have one state.
- Explain what makes something move. •
- •
- Know where light and dark come from. •

• The names of different animals around the world and what helps them

• Materials make objects and know some materials can be used for different

Know there are different types of plants and how they grow and survive.

 Name what is in our solar system and how our planet relates to it. Explain how forces around us impact the way we live, and the way things are

Describe how a materials properties affect the way it functions.

Describe why some circuits are more powerful than others.

Identify why we can see objects in the world around us.

Explain what affect evolution and inheritance have had on different species

Identify what makes our bodies run healthily and smoothly.

Identify the similarities and differences between rocks and soils.

Explain why vibrations are so important in relation to sound.

Describe why animals, including humans, can move around.

Name what animals, including humans, eat and how they do it.

#### Year 3 and 4 MTP

Theme:       Electricity         CURRICULUM AREA:       Science         FINAL OUTCOME/ ASSESSMENT OPPORTUNITY         (What all children will be able to talk about by the end o Key question: Why do electric appliances work?         PRIOR KNOWLEDGE         NEXT STEPS:         Links to Y3 Light         To know that some lights are powered by electricity/batteries       NEXT STEPS:         Links to Y2 Uses of Everyday Materials       Next steps:         To know the suitability of a variety of materials       To know about weather types e.g. lightning         Materials       To know the material an object is made from         To know wetal is a material       Links to 30 - 50 months Physical Development: Health and self-care         To know some ways to keep safe around electricity       To know the use of switches affects a circuit         To know some ways to keep safe around electricity       To know the symbols in an electrical circuit diagram		
CURRICULUM AREA:       Science         FINAL OUTCOME/ ASSESSMENT OPPORTUNITY         (What all children will be able to talk about by the end on Key question: Why do electric appliances work?         PRIOR KNOWLEDGE       NEXT STEPS:         Links to Y3 Light       To know that some lights are powered by electricity/batteries         Links to Y2 Uses of Everyday Materials       Next STEPS:         To know the suitability of a variety of materials       To know a range of metals and discuss their properties         Links to Y1 Seasonal Changes       To know which materials conduct electricity and which don't         To know weather types e.g. lightning       To know the material an object is made from         To know metal is a material       Links to 30 - 50 months Physical Development: Health and self-care         To know some ways to keep safe around electricity       To know the use of switches affects a circuit         Links to 40 - 60 months PSED – Self confidence and awareness       To know the symbols in an electrical circuit diagram	Theme:	Electricity
FINAL OUTCOME/ ASSESSMENT OPPORTUNITY         (What all children will be able to talk about by the end on Key question: Why do electric appliances work?         PRIOR KNOWLEDGE       NEXT STEPS:         Links to Y3 Light       NEXT STEPS:         To know that some lights are powered by electricity/batteries       Links to Y2 Uses of Everyday Materials         To know that some lights are powered by electricity/batteries       Links to Y5 Properties of materials         To know the suitability of a variety of materials       To know arange of metals and discuss their properties         Links to Y1 Seasonal Changes       To know about weather types e.g. lightning         Materials       To know the material an object is made from         To know metal is a material       Links to 30 - 50 months Physical Development: Health and self-care         To know some ways to keep safe around electricity       To know the use of switches affects a circuit         To know the symbols in an electrical circuit diagram       To know the symbols in an electrical circuit diagram	CURRICULUM AREA:	Science
(What all children will be able to talk about by the end on Key question: Why do electric appliances work?         PRIOR KNOWLEDGE       NEXT STEPS:         Links to Y3 Light       To know that some lights are powered by electricity/batteries         Links to Y2 Uses of Everyday Materials       To know the suitability of a variety of materials         To know the suitability of a variety of materials       Links to Y1 Seasonal Changes         To know about weather types e.g. lightning       Links to Y5 Properties of materials conduct electricity and which don't         To know the material an object is made from       To know the material an object is made from         To know metal is a material       Links to 30 - 50 months Physical Development: Health and self-care         To know some ways to keep safe around electricity       To know the use of switches affects a circuit         To know the use of 60 months PSED – Self confidence and awareness       To know the symbols in an electrical circuit diagram		FINAL OUTCOME/ ASSESSMENT OPPORTUNITY
PRIOR KNOWLEDGENEXT STEPS:Links to Y3Light To know that some lights are powered by electricity/batteries Links to Y2 Uses of Everyday Materials To know the suitability of a variety of materials 		(What all children will be able to talk about by the end of the unit) Key question: Why do electric appliances work?
Links to Y3LightTo know that some lights are powered by electricity/batteriesLinks to Y2Links to Y2Links to Y2Uses of Everyday MaterialsTo know the suitability of a variety of materialsTo know a range of metals and discuss their propertiesLinks to Y1Links to Y1Links to Y1Seasonal ChangesTo know about weather types e.g. lightningMaterialsTo know the material an object is made fromTo know metal is a materialLinks to 30 - 50 monthsLinks to 40 - 60 monthsVinks to 40 - 60 monthsTo know it is light in the day and dark at night	PRIOR KNOWLEDGE	NEXT STEPS:
To know equipment and tools have to be used safely (torches, batteries)	Links to Y3 Light To know that some lights are powered by electricity/batteries Links to Y2 Uses of Everyday Materials To know the suitability of a variety of materials To know a range of metals and discuss their properties Links to Y1 Seasonal Changes To know about weather types e.g. lightning <u>Materials</u> To know the material an object is made from To know metal is a material Links to 30 - 50 months Physical Development: Health and self-care To know some ways to keep safe around electricity Links to 40 - 60 months PSED – Self confidence and awareness To know it is light in the day and dark at night To know equipment and tools have to be used safely (torches, batteries)	<u>Links to Y5 Properties of materials</u> To know which materials conduct electricity and which don't To know the uses of everyday materials e.g. metal wires (copper) and plastic casing. <u>Links to Y6 Electricity</u> To know the number of cells and voltage in the circuit and how it is associated with the brightness of a la To know how the use of switches affects a circuit To know the symbols in an electrical circuit diagram

### Knowledge

- To know the names of common appliances that run on electricity
- To know what a circuit is
- To know the parts/components of a circuit
- To know what makes a circuit work
- To know how a switch works
- To know what conductors and insulators are

## **Enquiry Skills**

- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. This could be achieved by constructing a circuit and drawing a labelled diagram with non-standard images to record findings. (Observations)
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Use a circuit to test whether materials are conductors or insulators, record information in tables and explain results. (Pattern seeking)
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Use knowledge of a circuit to make predictions about which materials would be insulators or conductors. Use results from the enquiry into insulators/ conductors to raise further questions.
   (Grouping & Classifying)

mp/bulb or the volume of a buzzer.

ng a labelled diagram with non-standard images ors or insulators, record information in tables and explain which materials would be insulators or conductors. Use Different electrical equipment. How can we get them to work? Looking at closed circuits and those which need to join an electrical circuit.

## **VOCABULARY:**

Buzzer, Insulator, Electricity, Component, Cell, Battery, Lamp, Switch, Circuit, Conductor, Bulb, Symbol, Motor, Copper, Open, Closed, Series, Parallel

### **SMALL STEPS IN LEARNING:**

- What common appliances run on electricity? (Enquiry based identify electrical appliances and organising them into groups (Grouping and Classifying))
- What is a circuit? (Enquiry based recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. This could be achieved by constructing a circuit and drawing a labelled diagram with nonstandard images to record findings. (Pattern seeking/comparative testing (Observations))
- What are the different components in a circuit what functions do they have? (Identify a cell makes a circuit work and that a circuit must be complete) (Pattern seeking/comparative testing)
- How does a switch work? (Pattern seeking/comparative testing) •
- Are all materials electrical conductors? (Enquiry based reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Use a circuit to test whether materials are conductors or insulators, record information in tables and explain results. (Pattern seeking/Comparative Testing))
- Which materials can be used as electrical insulators? (Enquiry based using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Use knowledge of a circuit to make predictions about which materials would be insulators or conductors. Use results from the enquiry into insulators/ conductors to raise further questions. (Grouping & Classifying/Pattern Seeking/Comparative Testing))

### **IMPORTANT PEOPLE IN SCIENCE:**

- Thomas Edison (Inventor of the lightbulb and power grid)
- Joseph Swan (Physicist & Chemist who developed a primitive electric light 20 years before Thomas Edison) ٠
- Lewis Howard Latimer (Electronic Engineer who improved the design of Edison's light bulb and brought street lighting to the world)
- Ronit Kanwar links to free resources requiring a login (Businessman who set up company to provide affordable, sustainable solar-powered lights for poor in rural India) •
- ٠ William Kamkwamba - search document for Information (Inventor who used wind turbines to bring electricity to his village in Malawi)
- Zubera Iqbal (Chemist who explores sustainable ways to recycle electric vehicle batteries) •

Theme:	States of Matter (Materials)
CURRICULUM AREA:	Science
	FINAL OUTCOME/ ASSESSMENT OPPORTUNITY

## (What all children will be able to talk about by the end of the unit)

Key guestion: Does an object only have one state?

PRIOR KNOWLEDGE	NEXT STEPS:
Links to Y3 Plants:	
To know that plants produce oxygen which is a gas.	
(Carbon dioxide and nitrogen also gases)	
Links to Y2 Uses of everyday materials:	Links to Y5 Properties and Changes of Materials
To know that some materials are more suitable for	To know and explain the difference between reversible and irreversible changes.
particular uses (solids and water (frozen)	To know that dissolving, mixing and changes of state are reversible.
To know different uses for ice. Explain why an igloo	To know that some changes result in the formation of new materials, and that this kind of change is not usually reversi
would not be a suitable structure in different	Links to Y6 Light:
environments.	Know that an object's state can impact how light passes through it. E.g. water and ice.
Links to Y1 Everyday Materials:	
To know the simple physical properties of different	
materials (Solids and some exposure to liquids).	

#### Knowledge

- To know if an object is a solid, liquid or gases.
- To know the difference between solids, liquids and gases.
- To know that some materials change state when heated. •
- To know the part played by evaporation and condensation in the water cycle. •

### **Enquiry Skills**

- identifying differences, similarities or changes related to simple scientific ideas and processes This could be achieved by observing different materials to discover whether it is a solid, liquid or gas and how they change state. (Observations)
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Use observations to identify the differences in the properties of solids, liquids and gases. Investigate at which temperature the material changes state e.g. ice cubes/ chocolate/ cheese. They might observe and record evaporation over a period of time, for example, a puddle in the playground or a washing line, and investigate the effect of temperature on washing or drying or a snowman melting. (Comparative testing and Observing over time)
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Use drawings and labelled diagrams to explain the part played by evaporation and condensation in the water cycle. (Research)

## HOOK:

Initial hook – after lunch, have a freeze pop (unfrozen) at each child's seat. Explain you meeting so you put them out on the desk at the beginning of lunch. What happened?



knew it was hot outside and you wanted to give them a treat to cool them off when they got in but you had a

**VOCABULARY:** 

ible.

Temperature, Celsius, Compressibility, Soluble, Dissolve, Humidity, Condensation, Evaporation, Precipitation, Weight, Mass, Vapour, Solid, Liquid, Gas, Matter, Mixture, Climate, Pressure,

#### **SMALL STEPS IN LEARNING:**

- What are the differences between solids, liquids and gases? (Enquiry based identifying differences, similarities or changes related to simple scientific ideas and processes. This could be achieved by observing different materials to discover whether it is a solid, liquid or gas and organising them (Grouping and classifying/Observations)).
- What are materials made of and how does this affect whether something is a solid, liquid or gas? Practical particle activity in the hall with the children representing solids, liquids and gases. (Secondary Sources)
- Can I change a materials state if I change its temperature? (Enquiry based making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Use observations to identify the differences in the properties of solids, liquids and gases. Investigate at which temperature the material changes state e.g. water. (Comparative testing and Observing over time)).
- Do all materials change their state at the same temperatures? (Enquiry based making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, • including thermometers and data loggers Use observations to identify the differences in the properties of solids, liquids and gases. Investigate at which temperature the material changes state e.g. chocolate. (Comparative testing and Observing over time)).
- Why does temperature effect how quickly water evaporates? (Enquiry based making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, • including thermometers and data loggers They might observe and record evaporation over a period of time, for example, a washing drying on a line (Comparative testing and Observing over time)
- What is the water cycle? (Enquiry based recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Use drawings and labelled diagrams to explain the part played by evaporation and condensation in the water cycle (Secondary Sources - Research)).

## **IMPORTANT PEOPLE IN SCIENCE:**

- Joseph Priestley (Clergyman who discovered oxygen at about the same time as Carl Wilhelm Scheele)
- Carl Wilhelm Scheele (Chemist who discovered oxygen at about the same time as Joseph Priestley) ٠
- Daniel Fahrenheit (Physicist who invented the Fahrenheit temperature scale and the thermometer) •
- Anders Celsius (Astronomer who invented the degrees Celsius temperature scale) •

Theme:	Forces and Magnets
CURRICULUM AREA:	Science

# FINAL OUTCOME/ ASSESSMENT OPPORTUNITY

## (What all children will be able to talk about by the end of the unit)

Key question: What makes something move?

PRIOR KNOWLEDGE	NEXT STEPS:
Links to Y2 Animals inc humans To know that during exercise there are balanced and unbalanced forces. Links to Y1 Materials To know that some surfaces have friction. To know some materials are magnetic	Links to Y4         Sound         To know vibrations are caused by force         To know the size of vibration depends on the size of the force         Animals inc humans         To know that forces (pushing/ squeezing etc) are needed in digestion.         Links to Y5         Forces         To know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.         To know that some mechanisms, including pulleys and gears, allow a smaller force to have a greater effect.         Links to Y6         Animals inc humans         To know that there are forces within the body e.g. heart pumping blood.

## **CURRICULUM LINKS:**

#### Knowledge

- To know how things move on different surfaces.
- To know that some forces need contact between two objects, but magnetic forces act at a distance. •
- To know how magnetics attract or repel each other and attract some materials and not others •
- To know that everyday materials can be compared and grouped on the basis of whether they are attracted to a magnet, and identify some magnetic materials. •
- To know magnets have two poles.
- To know whether two magnets will attract or repel each other. Depending on which poles are facing

#### **Enquiry Skills**

- using straightforward scientific evidence to answer questions or to support their findings. Use magnets to test a range of materials to test whether they are magnetic or not and use this to make conclusions about what magnetic materials have in common. Pupils could look for patterns in the way that magnets react to each other. (Pattern seeking)
- setting up simple practical enquiries, comparative and fair tests
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. This could be achieved by testing how e.g. a car moves on different surfaces and using results to answer given questions, suggest improvements and raise further questions. Use results to raise further questions e.g. Are all metals magnetic? (Fair testing)

### HOOK:

Initial hook – Visit to a local playground or view a video of children playing at a local playground – why are they travelling down the slide? How are they moving on the swing/roundabout etc. You could also look at a very heavy object being needed to be moved around the school - what would be the best way to move it?

#### **VOCABULARY:**

Force, Magnets (bar, ring horseshoe), Attract, Repel, Strength, Magnetic, Surface, Poles, Push, Pull, Distance, Direct contact, Properties

- How can I make an object move using force?
- Does an object move the same way even when on a different surface? (Enquiry based using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. This could be achieved ٠ by testing how e.g. a car moves on different surfaces. This could be achieved by testing how a toy car travels across 5 boards covered with different surfaces; Ideas include sandpaper, a towel, tinfoil, lino, carpet, corrugated cardboard or bubble wrap and using results to answer given questions, suggest improvements and raise further questions (Fair testing)).
- Do all objects need contact to move? (Enquiry based setting up simple practical enquiries, comparative and fair tests. This could be achieved by testing how a toy car travels across 5 boards covered with different surfaces; Ideas include sandpaper, a towel, tinfoil, lino, carpet, corrugated cardboard or bubble wrap (Fair testing)).
- Do all magnets have the same strength? (Enquiry based setting up simple practical enquiries, comparative and fair tests. This could be achieved by testing how many paperclips different magnets pick up and using the results to compare strength (fair testing)).
- Do magnets attract all materials? (Enquiry based using straightforward scientific evidence to answer questions or to support their findings. Use magnets to test a range of materials to test whether they are magnetic or not and use this to • make conclusions about what magnetic materials have in common. This could be done through the 'Scrapyard Challenge' using steel paper clips, Bar magnets, Trays, Pile of magnetic and nonmagnetic materials mixed together per group; some ideas include coins, iron nails, steel paper clips, pens, pencils, drinks cans, food tins, wooden spoons or plastic tubs (pattern seeking, grouping and classifying)).
- How many poles does a magnet have? •
- Will a magnetic attract or repel another magnet? (Enquiry based using straightforward scientific evidence to answer questions or to support their findings. This can be done by observing how magnets react to each other and using them • to create compasses to find 'treasure' (pattern seeking)).

Theme:	Rocks
CURRICULUM AREA:	Science
	FINAL OUTCOME/ ASSESSMENT OPPORTUNITY

# (What all children will be able to talk about by the end of the unit)

Key question: Are all rocks and soils the same?

PRIOR KNOWLEDGE	NEXT STEPS:
Links to Y2	
Materials and their properties	
To know that particular materials are more	
suitable for a given purpose including rocks.	
Links to Y1	Links to Y4
Materials and their properties	States of matter
To know an object is different to the material	To know that some materials change state when they are heated or cooled.
from which it is made e.g. a statue made of rock.	To know that when rocks are heated to a very high temperature they change state.
To know names of a variety of everyday	Links to Y5
materials, including wood, plastic, glass, metal,	Animals Inc Humans:
water and rock.	States of matter
To know physical properties of rock.	To know how rock is changed when it is heated and cooled.
<u>Links to 30 - 50 months</u>	E.g. Formation of rock - lava (magma under the Earth's surface is melted rock)
Understanding the world	Links to Y6
To talk about natural and found objects such as	Evolution and inheritance
rocks.	To know that living things have changed over time and that fossils provide information about living things that inhabited the
<u>Links to 40 - 60 months</u>	
Understanding the world	
To know some basic similarities and differences	
materials, including rocks	
CURRICULUM LINKS:	

Knowledge

- To know different kinds of rocks on the basis of their appearance and simple physical properties
- To know how fossils are formed when things that have lived are trapped within rock
- To know that soils are made from rocks and organic matter

**Enquiry Skills** 

- recording findings using simple scientific language, drawings, labelled diagrams, keys, and tables. This could be achieved by observing a variety of rocks (using hand lenses or microscopes) and identifying and testing characteristics in the form of a table. (Grouping and classifying)
- identifying differences, similarities or changes related to simple scientific ideas and processes. This would enable similarities and differences to be identified. Research how fossils are made, make their own fossils and label diagrams to record the changes. (Researching, Grouping and Classifying)
- recording and classifying to help answer questions. This could be extended to classifying the rocks based on properties. Children to experience a range of soils and label the different parts. Storyboard of the cycle of changes from rock to soil to demonstrate scientific processes. (Grouping and Classifying)

Earth millions of years ago.

nses or microscopes) and identifying and testing I how fossils are made, make their own fossils and I the different parts. Storyboard of the cycle of Make the rock cycle with chocolate. While the NC doesn't specifically say we must name the three mains types of rock (igneous, sedimentary and metamorphic) it is implicitly which have crystals and where fossils are found while categorising.

How to Make a Delicious Rock Cycle with Chocolate Rocks - Left Brain Craft Brain

## VOCABULARY:

Granite, Chalk, Limestone, Organic, Permeable, Impermeable, Fossils, Sedimentary, Rocks, Slate, Marble, Matter, Property, Formation, Soil

- Is there only one type of rock? (Enquiry based recording findings using simple scientific language, drawings, labelled diagrams, keys, and tables. This could be achieve lenses or microscopes) and identifying and testing characteristics, i.e. rubbing rocks together to see their durability or how they may change in water, in the form of a tab
- What are the similarities and differences between different kinds of rocks? (Enquiry based recording and classifying to help answer questions. This could be extended Ensure you look at whether they have grains, crystals or layers (Grouping and Classifying))
- How are fossils formed? (Enquiry based identifying differences, similarities or changes related to simple scientific ideas and processes. This would enable similarities a fossils are made, make their own fossils and label diagrams to record the changes. (Researching, Grouping and Classifying))
- Is soil a type of rock? (Enquiry based recording and classifying to help answer questions. Children to experience a range of soils and label the different parts. Storyboard demonstrate scientific processes. (Grouping and Classifying))
- What different types of soils are there? (Enquiry based setting up simple practical enquiries, comparative and fair tests. Testing soil permeability. (Comparative and fa

y taught through looking at which have grains,	
ed by observing a variety of rocks (using hand ble. (Grouping and classifying)) to classifying the rocks based on properties.	
and differences to be identified. Research how	
rd of the cycle of changes from rock to soil to	
air testing))	

Theme:	Light	
CURRICULUM AREA:	Science	
	FINAL OUTCOME/ ASSESSMENT OPPORTUNITY	
(What all children will be able to talk about by the end of the unit)		
	Key question: Where do light and dark come from?	
PRIOR KNOWLEDGE	NEXT STEPS:	
Links to Y2	Links to Y6	
<u>Plants</u>	Light	
To know that plants	To know that light appears to travel in straight lines.	
need light to grow	To know that light travels in straight lines and use this to explain that objects are seen because they give out or reflect light into the eye.	
Living things and their	To know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.	
<u>habitat</u>	To know that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	
To know that some	Links to Y5	
animals are nocturnal.	Properties and changes of materials	
<u>Links to Y1</u>	To know that materials are either transparent, translucent and opaque.	
<u>Seasons</u>	Earth and space	
To know that light	To know that it is dangers to look at the sun,	
changes over four	To know what makes day and night	
seasons	To know that sundials use the sun to tell the time.	
Animals inc humans	Links to Y4	
To know that eyes help	Electricity	
us to see.	To know that electricity gives us man-made light sources.	

# **CURRICULUM LINKS:**

### Knowledge

- To know that light is needed in order to see things and that dark is the absence of light.
- To know that light is reflected from surfaces.
- To know that light from the sun can be dangerous and that there are ways to protect their eyes.
- To know that shadows are formed when the light source is blocked by a solid object.
- To know that there are patterns in the way that the size of shadows change.

## **Enquiry Skills**

- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including data loggers. This can be achieved by using data loggers \_ to test the amount of light in different places at different times of the day. Use standard measurements and record results using a bar chart. (Observing over time)
- 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 presentations of results and conclusions. Record measurements in the form of a table using standard measurements. \_ Investigate the change in the size of the shadow compared to the distance of the light source. Draw diagrams to explain how light is reflected from different surfaces. (Pattern seeking)

Idea – Show different light sources. Show a box, can you see what is inside? What about if holes are put in the box? You're adding light which will enable them to see.

# **VOCABULARY:**

Light, Dark, Shadow, Reflect, Light source, Solid, Block, Mirror, Reflective surface, Transparent, Translucent, Absence of light, Bright, Dull

- What is a light source and what are they?
- How does light help us to see? (Discuss that darkness is the absence of light)
- Do all surfaces reflect light? (Yes, that is how we see, but some reflect better than others) •
- Does the light from the sun help or hurt us? •
- Why do shadows form? (Enquiry based making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including data loggers. This can be achieved by using data loggers to test the amount of light in different places at different times of the day. Use standard measurements and record results using a bar chart. (Observing over time))
- Are there patterns in the way that the size of shadows change? (Enquiry based 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 presentations of results and conclusions. Record measurements in the form of a table using standard measurements. Investigate the change in the size of the shadow compared to the distance of the light source. Draw diagrams to explain how light is reflected from different surfaces. (Pattern seeking))

Theme:	Sound
CURRICULUM AREA:	Science

FINAL OUTCOME/ ASSESSMENT OPPORTUNITY

# (What all children will be able to talk about by the end of the unit)

Key question: Why are vibrations so important in relation to sound?

PRIOR KNOWLEDGE	NEXT STEPS:
Links to Y3	
Animals including humans	
To know the role of the bones in the	Links to Y5
ear for hearing. <u>Links to Y2</u>	Animals including humans Know that as we develop to old age our hearing begins to deteriorate.
Uses of everyday materials	As we grow older we struggle to hear different pitches. Earth and space
To know what materials would be	Know that there is no medium for sound to travel.
suitable for making a musical	Links to Y6
instrument.	Light:
<u>Links to Y1</u>	To know how sounds can also reflect off surfaces just like light and this can lead to echoes.
Animals including humans	<u>Electricity:</u>
To know the basic parts of the human	Evolution and inheritance:
body and be able to identify ears and	To know how animals have adapted and evolved to increase hearing ability and why this has led to the species success.
explain they give us the sense of	
hearing.	
CURRICULUM LINKS:	

## Knowledge

- To know how sounds are made vibrating.
- To know that vibrations need a medium to travel through to get to the ear.
- To know that different objects can produce a different pitch.
- To know that 'stronger' vibrations produce greater volume.
- To know that sound gets fainter as the distance from the source increases.

## **Enquiry Skills**

- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including data loggers Observe high and low pitched instruments comparing the sounds made with the types of vibrations. Show how volume effects the size of vibrations by observing e.g. rice on a drum. Use dataloggers to take and record the measurements of the volume of sound using standard units. (Comparative testing and Observations)

- setting up simple practical enquiries, comparative and fair tests

This could be achieved by investigating through a comparative and fair test, how the distance effects the strength of the sound. (Comparative and Fair testing)

PAGE 48

Initial hook – Instruments on table. Other ways to make sound. Music on the screen. Why can we hear? What are we hearing with? What is making the noise? What wouldn't make noise and why?

#### **VOCABULARY:**

Pitch, Vibrations, Medium, Volume, Conduct, Vacuum, Waves, Faint, Frequency, Vibrate, Insulate, particles

- How are sounds made?
- Why do vibrations need a medium to travel through to get to the ear?
- Do different objects produce different pitches? (Enquiry based Observe high and low pitched instruments comparing the sounds made with the types of vibrations. Show how volume effects the size of vibrations by • observing e.g. rice on a drum. (Comparative testing and Observations))
- How can we make noise produce greater volumes? (Enquiry based This could be achieved by investigating through a comparative and fair test, how the distance effects the strength of the sound. Use dataloggers to take and record the measurements of the volume of sound using standard units. (Comparative and Fair testing)).
- What happens to sound as the distance from the source increases? (Enquiry based This could be achieved by investigating through a comparative and fair test, how the distance effects the strength of the sound. Use dataloggers to take and record the measurements of the volume of sound using standard units. (Comparative and Fair testing)).

Theme:	Animals In
CURRICULUM AREA:	Science
FINAL OUTCOME/ ASSESSMENT OPPORTUNITY	·
(What all children will be able to talk about by the end of the unit)	
Key question: Why can animals, including humans, move around?	
PRIOR KNOWLEDGE	NEXT STEP
Links to V2	
Animals inc Humans:	
To know that animals (including humans) have offspring which grow into adults e.g. kittens into cats, puppies into dogs, babies into adults	Links to Y4
To know the basic needs of animals (including humans) e.g. food, water, air	Animals In
To know the importance for humans of exercise, eating the right amounts of different food and hygiene.	To know th
Links to Y1	digestion s
Animals inc Humans:	To know th
To know the names of a variety of animals and their groups (fish, amphibians, reptiles, birds and mammals)	animals) a
To know the difference between the different animal groups	To know a
To know the difference between carnivores, herbivores, omnivores	through a t
To know the features of different animals (body parts)	To know h
To know the difference between the features of different animals (body parts)	To know so
To know the names of different body parts and the names of the senses	Links to Y5
Links to 30 - 50 months	Animals In
Understanding the world	To know th
To know that we need to care for living things	To know th
To name several common animals (pets, farm animals) and plants (flower, tree)	Links to Y6
To know that animals move in different ways (imitate)	Animals In
Develop an understanding of growth, decay and changes over time	To know th
Physical Development – Health and self-care	the function
To know the effect activity has on our body	To know th
To manage to wash and dry hands.	the ways t
Links to 40 - 60 months	To know th
Understanding the world	transporte
To know that humans and animals may have similarities, and differences.	
To know that animals may have different numbers of body parts using the language of more/less/fewer.	

# Knowledge

- To know that animals (including humans) need the right types and amount of nutrition and that they cannot make their own food; nutrition comes from what they eat.
- To know that humans and some animals have skeletons and muscles for support and movement.

## **Enquiry Skills**

- recording findings using simple scientific language, drawings, labelled diagrams and tables. This could be achieved by conducting research around skeletons of different animals and presenting the information with \_ drawings and labelled diagrams. (Research)
- using straightforward scientific evidence to answer questions or to support their findings. Research could also be conducted into what food different animals eat to meet their nutritional needs. This could be recorded \_ as a table. (Research)

## cluding Humans

<u>c Humans:</u>

- he simple functions of the basic parts of the
- system in humans
- ne different types of teeth in humans (and other nd their simple functions.
- variety of food chains and how the energy flows food chain
- ow to correctly draw a food chain.
- ome producers, predators and prey.

- <u>c Humans:</u>
- ne changes as humans develop into old age
- ne gestation period of other animals and humans

# <u>c Humans:</u>

- he main parts of the human circulatory system, and ons of the heart, blood vessels and blood.
- ne impact of diet, exercise, drugs and lifestyle on heir bodies function.
- ne ways in which nutrients and water is ed

Owl pellets for dissection. Why are there bones? What are the bones? How did they get there?

# **VOCABULARY:**

Skeleton, Muscles, Skull, Ribs, Hips, Protection, Healthy Movement, Carbohydrates, Muscles, Protein, Fats, Sugar, Balanced diet

- What food groups are there? (Enquiry based Shopping bag of groceries, why have I bought different types of food? How could I group these foods? Why did I need to go to shop? Ch sort pictures of food into correct food group and create a balanced meal (Grouping and Classifying).)
- What different nutrition do different food groups give us?
- Do all animals need the same nutrition in their diets? (Enquiry based using straightforward scientific evidence to answer questions or to support their findings. Research could also be conducted into what food • different animals eat to meet their nutritional needs. This could be recorded as a table (Research).)
- Are all skeletons the same? (Enquiry based Sorting animals into groups depending on their skeleton (Grouping and Classifying). Recording findings using simple scientific language, drawings, labelled diagrams and tables. This could be achieved by conducting research around skeletons of different animals and presenting the information with drawings and labelled diagrams. (Research) Dog bone biscuits can be used to make it practical.)
- Do bones have specific names? •
- What are the functions of different bones? •
- Why are muscles so important? ٠

Theme:	Anima
CURRICULUM AREA:	Science
FINAL OUTCOME/ ASSESSMENT OPPORTUNITY	

# (What all children will be able to talk about by the end of the unit)

Key question: What and how do animals, including humans, eat?

PRIOR KNOWLEDGE	NEXT
Links to Y3	
Animals inc Humans:	Links
To know that animals (including humans) need the right types and amount of nutrition and that they cannot make their own food; nutrition comes from what they eat.	Anim
To know that humans and some animals have skeletons and muscles for support and movement.	To kr
Links to Y2	To kr
Animals inc Humans:	huma
To know that animals (including humans) have offspring which grow into adults e.g. kittens into cats, puppies into dogs, babies into adults	Links
To know the basic needs of animals (including humans) e.g. food, water, air	Anim
To know the importance for humans of exercise, eating the right amounts of different food and hygiene.	To kr
Links to Y1	syste
Animals inc Humans:	and h
To know the names of a variety of animals and their groups (fish, amphibians, reptiles, birds and mammals)	Tokr
To know the difference between the different animal groups	on th
To know the difference between carnivores, herbivores, omnivores	To kr
To know the features of different animals (body parts)	trans
To know the difference between the features of different animals (body parts)	
To know the names of different body parts and the names of the senses	

# **CURRICULUM LINKS:**

## Knowledge

- To know the simple functions of the basic parts of the digestion system in humans
- To know the different types of teeth in humans (and other animals) and their simple functions.
- To know a variety of food chains and how the energy flows through a food chain •
- To know how to correctly draw a food chain •
- To know some producers, predators and prey

## **Enquiry Skills**

- using straightforward scientific evidence to answer questions or to support their findings. This could be achieved by researching what food the different types of animals eat and linking this with the range of teeth that \_ each animal has. (Researching)
- asking relevant questions and using different types of scientific enquiries to answer them. Ask questions about the effect of diet on teeth. Use eggshell to investigate and answer these questions. (Comparative test)
- Identify differences, similarities or changes related to simple scientific ideas and processes. Identify what an animal would eat based on its teeth. Classify animals into producers, predators and prey according to their place in the food chain. (Grouping and Classifying)

Is Including Humans

STEPS:

to Y5

hals Inc Humans:

now the changes as humans develop into old age now the gestation period of other animals and ans

<u>s to Y6</u>

nals Inc Humans:

now the main parts of the human circulatory em, and the functions of the heart, blood vessels blood.

now the impact of diet, exercise, drugs and lifestyle ne ways their bodies function.

now the ways in which nutrients and water is sported

Children to have a healthy snack on table. Ask the children what will happen when they eat it. Do they know where it will go? What do you use to eat it? Use a mirror to see what happens when they bite, then when they chew - do they use the same parts of the mouth to do this?

## **VOCABULARY:**

Digestive system, Oesophagus, Stomach, Small/large intestines, Incisors, Molars, Pre-molars, Canines, Wisdom teeth, Milk teeth, Pulp, Enamel, Root, Gum, Food chain, Producer, Predator, Prey, Consume

- What are the different parts of the digestion system called?
- What are the functions of different parts of the digestive system? •
- Are teeth all the same? Children can name the teeth and use play doh to shape and model different types of teeth. ٠
- Why are teeth different shapes? (Enquiry based using straightforward scientific evidence to answer questions or to support their findings. This could be achieved by researching what food the different types of animals eat and linking this with the range of teeth that each animal has (Researching))
- How can teeth be damaged? (Enquiry based asking relevant questions and using different types of scientific enquiries to answer them. Ask questions about the effect of diet on teeth. Use eggshell to investigate and ٠ answer these questions. (Comparative test)).
- Do all food chains end with a carnivore? (Enquiry based Identify differences, similarities or changes related to simple scientific ideas and processes. Classify animals into producers, predators and prey according to their place in the food chain. Create food chains. (Grouping and Classifying)

#### **Science Year 5 and 6 Overview**

#### National Curriculum Content:

- To know the movement of the Earth, and other planets, relative to the sun in the solar system.
- To know the movement of the moon relative to the Earth. •
- To know the sun, Earth and moon are approximately spherical bodies.
- To know the Earth rotates.
- To know night and day is caused by the Earth's rotation. ٠
- To know and name the planets in the solar system and their order from the sun.
- To know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- To know the effects of air resistance, water resistance and friction that act between moving surfaces.
- To know that some mechanisms, including pulleys and gears, allow a smaller force to have a greater effect.
- To know the similarities and differences between everyday objects and be able to group them based on their properties and results of testing.
- To know that some materials are more suitable for particular uses than others based on testing and conclusions.
- To know that some materials will dissolve in liquid to form a solution, and know how to recover a substance from a solution.
- To know how mixtures might be separated, including through filtering, sieving and evaporating.
- To know and explain the difference between reversible and irreversible changes.
- To know that dissolving, mixing and changes of state are reversible changes.
- To know that some changes result in the formation of new materials and that this kind of change is not usually reversible. E.g. burning or mixing acid with bicarb.
- To know the changes as humans develop into old age.
- To know the gestation period of other animals and humans.
- To know the differences in the life cycles of a mammal, amphibian, insect and a bird. •
- To know the life process of reproduction in some plants and animals.
- To know the number of cells and voltage in the circuit and how it is associated with the brightness of a lamp/bulb or the volume of a buzzer. •
- To know how the use of switches affects a circuit
- To know the symbols in an electrical circuit diagram
- To know that light appears to travel in straight lines.
- To know that light travels in straight lines and use this to explain that objects are seen because they give out or reflect light into the eye.
- To know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.
- To know that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
- To know that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
- To know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
- To know how animals and plants adapted to suit their environment in different ways and that adaptation may lead to evolution. •
- To know the main parts of the human circulatory system, and the functions of the heart, blood vessels and blood.
- To know the impact of diet, exercise, drugs and lifestyle on the ways their bodies function.
- To know the ways in which nutrients and water is transported
- To know a range of observable characteristics of animals, microorganisms and plants.
- To give reasons for classifying plants, animals and microorganisms based on specific characteristics.

## Next Steps in Learning: Children will build on their learning in UKS2at KS3 by: Students develop scientific knowledge and understanding through studying Biology, Chemistry, and Physics equally across Key Stage 3 and 4. Students work scientifically across all three disciplines covering a broad range of experimental skills, which build upon and deepen the scientific knowledge and understanding covered in lessons. Students are encouraged to understand the links between subject areas and how science can be used to explain what is occurring in the world around them. This is enhanced by practical tasks where students progress through a cycle of hypothesis or prediction, practical experimentation emphasising accurate measurement,

### Assessment: By the end of UKS2 children should:

- things are made.

- Identify if all life cycles the same.

- species survival.

## **Prior Learning:** Children will have previously learnt:

- Explain why electric appliances work.
- Decide whether an object only have one state.
- Explain what makes something move.
- Identify the similarities and differences between rocks and soils.

- •

**Key Vocabulary:** 

variables, independent variable, dependent variable, control variable, evidence, justify, argument (science), causal relationship, accuracy, precision, scatter graphs, bar graphs, line graphs, force meter

observation and accurate recording, analysis, and evaluation.

• Name what is in our solar system and how our planet relates to it. • Explain how forces around us impact the way we live, and the way

- Describe how a materials properties affect the way it functions.
- Explain what happens during a human's life cycle.
- Describe why some circuits are more powerful than others.
- Identify why we can see objects in the world around us.
- Explain what affect evolution and inheritance have had on different

Identify what makes our bodies run healthily and smoothly.

Identify how living things can be classified.

- Know where light and dark come from.
- Explain why vibrations are so important in relation to sound.
  - Describe why animals, including humans, can move around.
  - Name what animals, including humans, eat and how they do it.

PAGE 54

## **Science MTP Year 5**

Theme:	Earth and Space	
CURRICULUM AREA:	Science	
FINAL OUTCOME/ ASSESSMENT OPPORTUNITY		
(What all children will b	be able to talk about by the end of the unit)	
Key question: What is in our solar system and how does our planet relate to it?		
PRIOR KNOWLEDGE	NEXT STEPS:	
Links to Y4		
Sound:		
To know that sound needs a medium to travel through		
To know that there is no medium in space between stars and planets and so there is no sound.		
Links to Y3	<ul> <li>Light – explore day and night due to the rotation of the Earth</li> </ul>	
Light	Explore how shadow clocks and sundials work	
To know that light from the sun is needed for us to be able to see across the planet.		
To know that shadow length is linked to the sun's apparent movement across the sky.		
Links to Y2		
Materials and their properties:		

To know some materials are suitable for things like space exploration.

# CURRICULUM LINKS:

## Knowledge

- To know the movement of the Earth, and other planets, relative to the sun in the solar system.
- To know the movement of the moon relative to the Earth. ٠
- To know the sun, Earth and moon are approximately spherical bodies.
- To know the Earth rotates.
- To know night and day is caused by the Earth's rotation. ٠
- To know and name the planets in the solar system and their order from the sun.

## **Enquiry Skills**

## - identifying scientific evidence that has been used to support or refute ideas or arguments

This could be achieved by providing true and false facts or misconceptions of the movement of the earth, moon, planets and the apparent movement of the sun across the sky. Children to use knowledge to argue why this is incorrect. Look at the different theories past and present eg Flat Earthers. (Research)

# HOOK:

Initial hook – photos of items relating to space travel/astronauts. Videos of space travel – why would they need these things? What would you need to take? What would you leave behind?

Fruit on table, which is Earth, can you name the other planets? How many would we need for our solar system? Order them from distance to the sun. What would you see if you travelled up to space? Oreo Moon phases. Modelling orbit physically.









PAGE 55

## **VOCABULARY:**

Sun, Moon, All planets of solar system, Solar System, Orbit, Planets, Spherical, Rotate, Axis, star, Tilt, Gravity, Elliptical orbit, Asteroid, Eclipse, Satellite, Lunar, Equator, Northern and southern hemisphere, poles

- How did the world begin? (Enquiry Comparison of different views, Research on BBT and refuting ideas)
- Is the Earth flat? (Enquiry Research flat Earth belief and evidence to refute)
- What are the names of the planets and what order are they from the Sun? (Fruit activity from Hook)
- How does the Earth move? (Practical movement on playground with balls and orbits)
- Why do we have night and day?
- Why does the moon change shape during a month? (Oreo activity)

Theme:

**CURRICULUM AREA:** 

FINAL OUTCOME/ ASSESSMENT OPPORTUNITY

(What all children will be able to talk about by the end of the unit)

Key question: How do forces around us impact the way we live and the way things are made?

PRIOR KNOWLEDGE
Links to Y4
Sound
To know vibrations are caused by force
To know the size of vibration depends on the size of the force
Animals inc humans
To know that forces (pushing/ squeezing etc) are needed in digestion.
Links to Y3
Forces and magnets
To know how things move on different surfaces.
To know that some forces need contact between two objects, but magnetic forces act at a distance.
To know how magnetics attract or repel each other and attract some materials and not others
To know that everyday materials can be compared and grouped on the basis of whether they are attracted to a magnet, and identify some magnetic materials.
To know magnets have two poles.
To know whether two magnets will attract or repel each other. Depending on which poles are facing
Links to Y2
Animals inc humans
To know that during exercise there are balanced and unbalanced forces.
Links to Y1
Materials
To know that some surfaces have friction.
To know some materials are magnetic
CURRICULUM LINKS:

Knowledge

- To know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- To know the effects of air resistance, water resistance and friction that act between moving surfaces. ٠
- To know that some mechanisms, including pulleys and gears, allow a smaller force to have a greater effect.

## **Enquiry Skills**

- using test results to make predictions to set up further comparative and fair tests. This could be achieved by... carrying out initial investigations into air resistance and using results to create a new question related to water resistance (e.g. can findings from air resistance be applied to water resistance) to create new question to investigate. (Comparative and Fair Testing)
- reporting and presenting findings from causal relationships. This could be achieved by measuring of time/distance of paper aeroplane to investigate air resistance, recording velocity. Reporting findings on the surface area of a spinner/parachute and the time taken to fall to the ground. Presenting findings to class in a more formal style. (Pattern Seeking)

Forces Science

**NEXT STEPS:** 

Links to Y6 Animals inc humans To know that there are forces within the body e.g. heart pumping blood.

Initial hook - objects on a table that need forces to work. Children to explain how they would make them move. Would anything make them move faster/slower? Why are t air? Why is a ball floating and not sinking?

### **VOCABULARY:**

Gravity, Resistance, Air resistance, Water resistance, Mechanisms, Levers, Pulleys, Gears, Balanced forces, Friction

- What different forces are there? (identify gravity, air resistance, water resistance and friction)
- How does gravity work? •
- How does air resistance affect the distance a paper aeroplane travels? (Enquiry based using test results to make predictions to set up further comparative and fair test • testing whether the shape of a paper plane (pointed/flat/round front) affects the distance it travels. Use these results to create a new question related to water resistance (e.g. does the shape of a boat affect the distance it travels. it travels across water before the next session (Comparative and Fair Testing)).
- How does water resistance affect the distance a boat travels? (Enquiry based setting up simple practical enquiries, comparative and fair tests. This could be achieved by testing how the shape of a playdoh boat affects • the distance travelled, making sure there is a developed prediction linked to the results of the previous enquiry (fair testing)).
- What material would cause the most friction to create a good brake pad? (Enquiry based reporting and presenting findings from causal relationships (Pattern Seeking)).
- How do mechanisms, including pulleys and gears, help objects to be moved more easily? •

they on the table and not falling off/floating in the
sts. Carry out initial investigation into air resistance

Theme:	Properties of Everyday Materials	
CURRICULUM AREA:	Science	
FINAL OUTCOME/ ASSESSMENT OPPORTUNITY		
(What all children will be able to talk about by the end of the unit)		
Key question: How does a materials properties affect the way it functions?		
PRIOR KNOWLEDGE	NEXT STEPS:	
Links to Y4		
States of matter		
To know that some materials are solids, liquids and gases.		
To know that some materials can change state.		
Electricity		
To know which materials are better conductors of electricity (metals).		
Links to Y3		
<u>Magnets</u>		
To know that some materials are magnetic and non-magnetic.		
To know that most metals are magnetic.	Links to Y6	
Links to Y2	Light	
Everyday Materials	To know which materials are better reflectors of light.	
To know that some materials are more suitable than others for specific uses.		
To know how the shape of some solid objects can be changed in different ways.		
Links to Y1		
Everyday Materials		
To know differences between an object and the material from which it is made.		
To know and name a variety of materials:		
Wood, plastic, glass, metal, water, rock		
To know some simple physical properties of a variety of materials.		
To know how some materials have different properties to others.		
CURRICULUM LINKS:		

Knowledge

- To know the similarities and differences between everyday objects and be able to group them based on their properties and results of testing.
- To know that some materials are more suitable for particular uses than others based on testing and conclusions. ٠
- To know that some materials will dissolve in liquid to form a solution, and know how to recover a substance from a solution.
- To know how mixtures might be separated, including through filtering, sieving and evaporating.
- To know and explain the difference between reversible and irreversible changes. •
- To know that dissolving, mixing and changes of state are reversible changes. ٠
- To know that some changes result in the formation of new materials and that this kind of change is not usually reversible. E.g. burning or mixing acid with bicarb. ٠

## Skills

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. This could be achieved by... giving children a range of problems to overcome. (e.g. which material is the most suitable to keep ice cream cold?) and pupils independently creating their own questions to facilitate the investigation into properties of materials. Are all questions generated by pupils testable? Teacher to support refining of questions. (Comparative and Fair Testing)
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. This could be achieved by accurately of measuring temperature and temperature changes over time. Selecting the most appropriate equipment for the experiment they are investigating. (Comparative and Fair Testing) recording data and results of increasing complexity using scientific tables, bar and line graphs. This could be achieved by... drawing lines graphs to show the relationship between time and temperature of insulators. Drawing bar charts to show the hardness of the materials. (Pattern Seeking)

HOOK:

PAGE 59

Initial hook – Children be given different materials, what properties can they identify? How could they group them? Match vocabulary to materials. How can these materials be changed? What are they used for? Different objects made of different materials to check they're naming materials not objects.

## **VOCABULARY:**

Solubility, Transparency, Conductivity, Filter, Evaporation, Dissolving, Sieving, Reversible, Irreversible, Hardness, Magnetic, Mixing, Liquid, Solution, Melting

- How are everyday materials compare to each other? (Enquiry based this could be achieved by testing different materials according to their properties and then grouping and classifying them into Venn/Carroll Diagrams based on their findings. Children could also devise their own comparative test to identify results and record these into tables and charts (Comparative and Fair Testing/Pattern Seeking/Grouping and Classifying)
- What materials keep objects cool? (Enquiry based Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. This could be achieved by... giving children a range of problems to overcome. (e.g. which material is the most suitable to keep ice cream cold?) and pupils independently creating their own questions to facilitate the investigation into properties of materials. Are all questions generated by pupils testable? Teacher to support refining of questions. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. This could be achieved by accurately of measuring temperature and temperature changes over time. Selecting the most appropriate equipment for the experiment they are investigating. recording data and results of increasing complexity using scientific tables, bar and line graphs. This could be achieved by... drawing lines graphs to show the relationship between time and temperature of insulators. Drawing bar charts to show the hardness of the materials. (Pattern Seeking/Comparative and Fair Testing))
- What happens when different solids are mixed with the liquid water? (Enquiry based mixing salt/sugar with water, what happens? Can we get it back? Comparative test to see if heat affects how quickly something • dissolves, create graphs to show results and seek patterns. (Comparative and Fair Testing/Pattern Seeking)).
- Can mixtures be separated in different ways? ٠
- Are all changes reversible? (Identify differences between reversible and irreversible changes and identifying that dissolving, mixing and changes of state are reversible changes.)
- What happens when an irreversible change takes place? (Enquiry based burning or mixing acid with bicarb (Comparative and Fair Testing)

Autumn 1 Theme: CURRICULUM AREA: FINAL OUTCOME/ ASSESSMENT OPPORTUNITY (What all children will be able to talk about by the end of the unit)	Animal Science
CURRICULUM AREA:         FINAL OUTCOME/ ASSESSMENT OPPORTUNITY         (What all children will be able to talk about by the end of the unit)	Science
FINAL OUTCOME/ ASSESSMENT OPPORTUNITY (What all children will be able to talk about by the end of the unit)	
(What all children will be able to talk about by the end of the unit)	
Key question: What happens during a humans life cycle?	
PRIOR KNOWLEDGE	NEXT S
Links to Y4	
Animals Inc Humans:	
To know the simple functions of the basic parts of the digestion system in humans	
To know the different types of teeth in humans (and other animals) and their simple functions.	
To know a variety of food chains and how the energy flows through a food chain	
To know how to correctly draw a food chain	
To know some producers, predators and prey	
Links to Y3	
Animals inc Humans:	Links to
To know that animals (including humans) need the right types and amount of nutrition and that they cannot make their own food; nutrition comes from what the	y <u>Animal</u>
eat.	To kno
To know that humans and some animals have skeletons and muscles for support and movement.	and the
Links to Y2	To kno
Animals inc Humans:	the wa
To know that animals (including humans) have offspring which grow into adults e.g. kittens into cats, puppies into dogs, babies into adults	To kno
To know the basic needs of animals (including humans) e.g. food, water, air	transpo
To know the importance for humans of exercise, eating the right amounts of different food and hygiene.	
Links to Y1	
Animals inc Humans:	

To know the names of a variety of animals and their groups (fish, amphibians, reptiles, birds and mammals)

To know the difference between carnivores, herbivores, omnivores

To know the features of different animals (body parts)

To know the difference between the features of different animals (body parts)

To know the names of different body parts and the names of the senses

**CURRICULUM LINKS:** 

Knowledge

- To know the changes as humans develop into old age.
- To know the gestation period of other animals and humans.

## **Enquiry Skills**

recording data and results of increasing complexity using scientific diagrams and labels This could be achieved by finding patterns in the growth process linked to ageing. labelling diagrams to show before and after puberty or other changes that occur during pregnancy (e.g. a growing foetus – the differences at different stages of development). This could be achieved by finding patterns in the above collected data. (Observing Over Time & Pattern Seeking)

HOOK:

s Including H	lumans
---------------	--------

EPS:

Y6

<u>S Inc Humans:</u>

v the main parts of the human circulatory system, functions of the heart, blood vessels and blood. v the impact of diet, exercise, drugs and lifestyle on s their bodies function.

v the ways in which nutrients and water is rted

## Children to have photos of people at different ages. Can they order them. Why did they group them in this way?

## **VOCABULARY:**

Puberty, Sibling, Offspring, Young, Adult, Teenager, Elderly, Retirement, Gestation, Life cycle, Period

- What is the timeline of a human life cycle?
- How do babies develop into children? •
- When does puberty take place?
- What changes take place when adults become elderly?
- Are the gestation periods for all animals the same? (Enquiry based recording data and results of increasing complexity using scientific diagrams and labels This could be achieved by finding patterns in the growth process linked to ageing. labelling diagrams to show before and after puberty or other changes that occur during pregnancy (e.g. a growing foetus – the differences at different stages of development). This could be achieved by finding patterns in the above collected data. (Observing Over Time & Pattern Seeking)).



Theme:		Living Thin
CURRICULUM AREA:		Science
	FINAL OUTCOME/ ASSESSMENT OPPORTUNITY	
	(What all children will be able to talk about by the end of the unit) Key question: Are all life cycles the same?	
PRIOR KNOWLEDGE		NEXT STEP
Links to Y4 Living Things and Their Habitats		
To know key characteristics of plants and animals. To know different ways to group living things eg mammals etc, evergreen etc To know a variety of living things in their local and wider environment.		

To know that environments can change and that this can sometimes pose dangers to living things.

Links to Y3

Plants

To know types of plants – flowering vs non flowering

Animals inc Humans

To know some animals are vertebrates while others invertebrates

Links to Y2

Living Things and Their Habitats

To know the differences between things that are living, dead and things that have been alive.

To know that most living things live in habitats to which they are situated. To know that different kinds of animals and plants depend on each other.

To know and name a variety of plants and animals in their habitats including microhabitats.

To know how animals obtain their food from plants and other animals, using the idea of a simple food chain and identify and name different sources of food.

Links to Y1

Animals, including humans

To know carnivore, herbivores and omnivores and understand that they eat different things.

**CURRICULUM LINKS:** 

Knowledge

- To know the differences in the life cycles of a mammal, amphibian, insect and a bird.
- To know the life process of reproduction in some plants and animals.

**Enquiry Skills** 

- Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. This could be achieved by... creating presentations based on findings from research into the lifecycle of animals from different kingdoms (focus on comparing mammal, amphibian, insect and bird) Look for patterns with the life cycle of animals and their habitats. (Research Using Secondary Sources)
- recording data and results of increasing complexity using tables, and classification keys. This could be achieved by... applying knowledge of lifecycles of animals from different kingdoms and using them to identify which kingdom an animal would belong to using a classification key. (E.g. birds start as an egg where as amphibians are born in water) (Grouping and Classifying)

# HOOK:

Initial hook – lots of images of living things (at different stages of their life) on the tables. How could children organise and group these? Can they create life cycles? Can the group them into mammals, insects, amphibians, birds, fish, reptiles? Can they identify vertebrates and invertebrates? Asexual and sexual reproduction?

**VOCABULARY:** 

	6		
2	2		
	-	-	

Links to Y6 Living Things and Their Habitats To know a range of observable characteristics of animals, microorganisms and plants.

To give reasons for classifying plants, animals and microorganisms based on specific characteristics.

Asexual/sexual puberty, Organism, Offspring, Nutrition, Excretion, Respire, Sibling, Stamen, Stigma, Sepal, Ovual, Pollination, Reproduction, Fertilise(tion), Germinate(tion), Movement, Sensitivity, Growth, Retirement

- Do all living things reproduce in the same way? (Identify the different between asexual and sexual reproduction and the focus on sexual reproduction of plants) ٠
- How do plants reproduce asexually? (Enquiry based set up an investigation to grow a plant from cuttings off a parent plant and keep a diary of it's growth over the unit (Observing over time))
- What are the different life cycles of mammals? (Placentals, Monotremes, Marsupials) •
- What happens in the life cycles of amphibians and insects?
- How can Lidentify what type of animal a living thing is through their life cycle? (Enquiry based recording data and results of increasing complexity using tables, and classification keys. This could be achieved by... • applying knowledge of lifecycles of animals from different kingdoms and using them to identify which kingdom an animal would belong to using a classification key. (E.g. birds start as an egg where as amphibians are born in water) (Grouping and Classifying)
- What are the similarities and differences in the life cycles of mammals, amphibians, insects and birds? (Enquiry based Reporting and presenting findings from enquiries, including conclusions, in oral and written forms • such as displays and other presentations. This could be achieved by... creating presentations based on findings from research into the lifecycle of animals from different kingdoms (focus on comparing mammal, amphibian, insect and bird) Look for patterns with the life cycle of animals and their habitats. (Research Using Secondary Sources))
- Why are people like Jane Goodall and David Attenborough important? (Enquiry based Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other • presentations. This could be done by comparing both naturalists, or children researching the one which interests them the most and comparing results and creating a presentation orally, through ICT or with a biography (Research Using Secondary Sources))

Year 6 MTP		
Theme:		Electricity
CURRICULUM AREA:		Science
FINAL OUTCOME/ ASSESSMENT OPPORTUNITY		

## (What all children will be able to talk about by the end of the unit)

Key question: Why are some circuits more powerful than others?

PRIOR KNOWLEDGE	NEXT STEPS:
Links to Y5         Properties of materials         To know which materials conduct electricity and which don't         To know the uses of everyday materials e.g. metal wires (copper) and plastic casing.         Links to Y4         Electricity         To know the names of common appliances that run on electricity         To know what a circuit is         To know the parts/components of a circuit         To know how a switch works         To know what conductors and insulators are         Links to Y3         Light         To know that some lights are powered by electricity/batteries	<ul> <li>KS3 Curriculum</li> <li>Current electricity</li> <li>electric current, measured in amperes, in circuits, series at meet and current as flow of charge</li> <li>potential difference, measured in volts, battery and bulb ratio of potential difference (p.d.) to current</li> <li>differences in resistance between conducting and insulatint Static electricity</li> <li>separation of positive or negative charges when objects at between charged objects</li> <li>the idea of electric field, forces acting across the space between betw</li></ul>

**CURRICULUM LINKS:** 

### Knowledge

- To know the number of cells and voltage in the circuit and how it is associated with the brightness of a lamp/bulb or the volume of a buzzer.
- To know how the use of switches affects a circuit
- To know the symbols in an electrical circuit diagram

## **Enquiry Skills**

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. This could be achieved by... comparative tests using light/ sound and number of batteries/ cells in the circuit. Pupils create own questions – pupils challenge each other on if they are testable and offer advice to refine. (Comparative and Fair Testing)
- using test results to make predictions to set up further comparative and fair tests. This could be achieved by... comparative tests using light/ sound and number of batteries/ cells in the circuit. (Comparative and Fair -Testing)
- Recording data and results of increasing complexity using scientific diagrams and charts. This could be achieved by drawing circuit diagrams showing how to increase brightness of bulbs. Create an alarm system to show increase in buzzer loudness. (Comparative and Fair Testing)

nd parallel circuits, currents add where branches atings; resistance, measured in ohms, as the ratio ng components (quantitative) re rubbed together: transfer of electrons, forces tween objects not in contact

## **VOCABULARY:**

Voltage, Amp, Current, Resistance, Resistor, Transformer, Filament, Energy, Component

- How has electricity impacted our lives?
- What symbols are used to represent components within an electrical circuit diagram? ٠
- Does the amount of voltage affect the brightness of a bulb? (Enquiry based planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. This • could be achieved by comparative tests using light and number of batteries cells in the circuit. Pupils create own questions – pupils challenge each other on if they are testable and offer advice to refine. (Comparative and Fair Testing)).
- How does the amount of cells affect the volume of a buzzer? (Enquiry based using test results to make predictions to set up further comparative and fair tests. This could be achieved by using the results of the • previous enquiry to create a prediction and then complete another comparative tests using sound and number of batteries/cells in the circuit. (Comparative and Fair Testing)).
- What affect do switches have on a circuit? (Enquiry based Recording data and results of increasing complexity using scientific diagrams and charts. This could be achieved by creating an alarm system or traffic light system including switches and then drawing circuit diagrams to represent. (Comparative and Fair Testing)).

Autumn 1 Theme:	Light
CURRICULUM AREA:	Science

#### FINAL OUTCOME/ ASSESSMENT OPPORTUNITY

## (What all children will be able to talk about by the end of the unit)

Key question: Why can we see objects in the world around us?

PRIOR KNOWLEDGE	NEXT STEPS:
Links to YS Properties and changes of materials To know that materials are either transparent, translucent and opaque. Earth and space To know that it is dangers to look at the sun, To know what makes day and night To know that sundials use the sun to tell the time. Links to Y4 Electricity To know that electricity gives us man-made light sources. Links to Y3 Light To know that light is needed in order to see things and that dark is the absence of light. To know that light is reflected from surfaces. To know that light from the sun can be dangerous and that there are ways to protect their eyes. To know that shadows are formed when the light source is blocked by a solid object. To know that there are patterns in the way that the size of shadows change. Links to Y1 Seasons To know that light changes over four seasons Animals inc humans To know that eyes help us to see.	<ul> <li>KS3 Curriculum</li> <li>the similarities and differences between light waves and waves in matter</li> <li>light waves travelling through a vacuum; speed of light</li> <li>the transmission of light through materials: absorption, diffuse scattering and specula</li> <li>use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of li (qualitative); the human eye</li> <li>light transferring energy from source to absorber, leading to chemical and electrical e cameras</li> <li>colours and the different frequencies of light, white light and prisms (qualitative only) diffuse reflection</li> </ul>
CURRICULUM LINKS:	

Knowledge

- To know that light appears to travel in straight lines.
- To know that light travels in straight lines and use this to explain that objects are seen because they give out or reflect light into the eye.
- To know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.
- To know that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

## **Enquiry Skills**

- Making systematic and careful observations and taking accurate measurements.

This could be achieved by using data loggers to record light measure. (Pattern Seeking)

- using test results to make predictions to set up further comparative and fair test.

This could be achieved by... using knowledge of experiments from reflection to determine the best position of mirrors to complete a light maze/ periscope. (Comparative and Fair Testing) HOOK:

ar reflection at a surface ight and action of convex lens in focusing

effects; photosensitive material in the retina and in

); differential colour effects in absorption and

## Spoke to Y6, they are going to add their own

Idea - What Is Light? Ancient Greeks argued over whether light rays emanated from a person's eye or the object being. Who do you agree with and why? Show a puppet show and ask how this is created.

## **VOCABULARY:**

Reflect, Direction, Refraction, Light spectrum, Beam, Lens, Iris, Retina, Pupils

- How does light travel?
- Why does something being reflective help me to see an object?
- How can we use light to help us to see objects? (Enquiry based creating a periscope or light maze or where best to place mirrors on cars?)
- Why do shadows have the same shape as the objects that cast them? (Puppet show?)
- What makes a shadow darker? (Enquiry based using data loggers to record light measure with different materials and how opaque they are (Pattern Seeking))



Theme:		Evolution and Inheritance
CURRICULUM AREA:		Science
		ту

## (What all children will be able to talk about by the end of the unit)

Key question: What affect has evolution and inheritance had on different species survival?

PRIOR KNOWLEDGE	NEXT STEPS:
Links to Y5	
Living things and their habitats	KS3 Curriculum
To know life cycles of different plants and animals around the world	Genetics and evolution
Links to Y4	Inheritance, chromosomes, DNA and g
Living things and their habitats	Heredity as the process by which gener
To know that environments change	the next.
To know plants and animals sometimes change to adapt (or can't adapt and become extinct)	A simple model of chromosomes, gene
To know we can use classification keys to identify animals	Watson, Crick, Wilkins and Franklin in t
Links to Y3	between species.
Rocks	The variation between individuals with
To know how fossils are formed.	include measurement and graphical re
To know where fossils are found.	The variation between species and bet
To know plants and animals can be fossilised.	organisms compete more successfully,
<u>Plants</u>	Changes in the environment may leave
To know plants are grown to produce different fruits and grow better in different environments / conditions.	species, less well adapted to compete s
Links to Y2	extinction.
Living things and their habitats	The importance of maintaining biodive
To know what a simple food chain is.	hereditary material.
To know habitats provide basic needs for animals and plants	

### **CURRICULUM LINKS:**

Knowledge

- To know that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
- To know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. ٠
- To know how animals and plants adapted to suit their environment in different ways and that adaptation may lead to evolution.

### **Enquiry Skills**

- recording data and results of increasing complexity using scientific diagrams and labels
- Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. This could be achieved by... giving children specific animals and get them to use labelled diagrams and to present information on how an animal is adapted to live in its environment. Present findings on the work of e.g. Mary Anning, Charles Darwin and Alfred Wallace. (Research)
- identifying scientific evidence that has been used to support or refute ideas or arguments. This could be achieved by... showing children a range of images of parent birds and then they have, to identify possible offspring (including red herrings). Analyse the advantages and disadvantages of specific adaptations such as being on 2 feet rather than 4, having a long or short beak, having gills or lungs, having tendrils on climbing plants, brightly coloured and scented flowers. (Research)

## HOOK:

Children create DNA strands and look at similarities and differences to help instigate discussion on evolution and inheritance. Look at photos of siblings, parents and other family members to see similarities and differences.

# enes

tic information is transmitted from one generation to

es and DNA in heredity, including the part played by the development of the DNA model Differences

- in a species being continuous or discontinuous, to presentation of variation.
- ween individuals of the same species means some which can drive natural selection.
- individuals within a species, and some entire successfully and reproduce, which in turn may lead to

ersity and the use of gene banks to preserve

Offspring, Adaptation, Characteristics, Breads, Environments, Genes, Evolution, Environments, Palaeontologists, Survival, Species, Classification

- Do offspring always vary from their parents? (Enquiry based Look at how asexual reproduction produces identical copies and sexual reproduction produces variations. Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. This could be achieved by... children creating drawings of what the offspring of two parents would look like and what characteristics could be inherited. (Research))
- How do variations lead to adaptations which help living things adapt to their environment? •
- Does variation in offspring over time make animals more or less able to survive in particular environments? (Enquiry based This can include, for example, exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Identifying scientific evidence that has been used to support or refute ideas or arguments. This could be achieved by... showing children a range of images of parent birds and then they have, to identify possible offspring (including red herrings). Analyse the advantages and disadvantages of specific adaptations such as being on 2 feet rather than 4, having a long or short beak, having gills or lungs, having tendrils on climbing plants, brightly coloured and scented flowers. (Research))
- What is the Theory of Evolution? (Enquiry based Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. Present findings on the work of e.g. Mary Anning, Charles Darwin and Alfred Wallace. (Research))
- What evidence is there that evolution exists? (Enquiry based observing fossils and secondary sources of evidence and comparing them to form conclusions and ideas. Identifying scientific evidence that has been used to support or refute ideas or arguments. (Research))
- How are fossils formed? (Share with the children the work of palaeontologists such as Mary Anning) •
- Does human evolution exist? (Enquiry based observing fossils and secondary sources of evidence and comparing them to form conclusions and ideas. Identifying scientific evidence that has been used to support or refute ideas or arguments. (Research))
- How can humans impact on evolution? (Enguiry based Look at selective breeding. This can include discussions on the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. (Research))

Theme:	Animals Including Humans		
CURRICULUM AREA:	Science		
FINAL OUTCOME/ ASSESSMENT OPPORTUNITY			
(What all children will be able to talk about by the end of the unit)			
Key question: What makes our bodies run healthily and smoothly?			
PRIOR KNOWLEDGE	NEXT STEPS:		
Links to Y4 Animals Inc Humans: To know the simple functions of the basic parts of the digestion system in humans To know the different types of teeth in humans (and other animals) and their simple functions. Links to Y3 Animals inc Humans: To know that animals (including humans) need the right types and amount of nutrition and that they cannot make their own food; nutrition comes from what they eat. Links to Y2 Animals inc Humans: To know the basic needs of animals (including humans) e.g. food, water, air To know the importance for humans of exercise, eating the right amounts of different food and hygiene. Links to Y1 Animals inc Humans: To know the difference between carnivores, herbivores, omnivores To know the features of different animals (body parts) To know the difference between the features of different animals (body parts)	KS3 Curriculum         The skeletal and muscular systems         The structure and functions of the human skeleton, to include cells         Biomechanics – the interaction between skeleton and muscles different muscles         The function of muscles and examples of antagonistic muscles         Nutrition and digestion         Content of a healthy human diet: carbohydrates, lipids (fats an and water, and why each is needed         Calculations of energy requirements in a healthy daily diet         The tissues and organs of the human digestive system, includin system digests food (enzymes simply as biological catalysts)         The importance of bacteria in the human digestive system         Health         The effects of recreational drugs (including substance misuse)		
CURRICULUM LINKS:			

## Knowledge

- To know the main parts of the human circulatory system, and the functions of the heart, blood vessels and blood.
- To know the impact of diet, exercise, drugs and lifestyle on the ways their bodies function.
- To know the ways in which nutrients and water is transported •

**Enquiry Skills** 

- recording data and results of increasing complexity using scientific diagrams and labels. This could be achieved by...labelling diagrams to show parts of the circulatory system (showing the parts). Can also use labels during heart dissection to show the parts of the heart. (Research)
- Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. This could be achieved by...an overview of different people's lifestyles and comment on which people would be the most likely to have certain health issues/ conditions. More formal whole class presentations to share and report findings – discussion of confidence of findings. (Research & Observing)
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. This could be achieved by... using pulse meters and stop watches to record heart rate before, during and after exercise. (Observing)

HOOK:

Children to have a big piece of paper and draw around themselves - can they label the main body parts and internal organs? Can they remember the skeleton and what organs they protect? Could they predict how blood flows?

**VOCABULARY:** 

support, protection, movement and making blood

s, including the measurement of force exerted by

.

nd oils), proteins, vitamins, minerals, dietary fibre

starvation and deficiency diseases ng adaptations to function and how the digestive

on behaviour, health and life processes.

Circulatory system, Aorta, Ventricles, Arteries, Capillaries, White/red blood cells, Bloodstream, Drug substances, Glucose, Starch, Trans and saturated fats, Medicine

- What are the main parts of the human circulatory system called? (Enquiry based recording data and results of increasing complexity using scientific diagrams and labels. This could be achieved by...labelling diagrams to show parts of the circulatory system (showing the parts). Can also use labels during heart dissection to show the parts of the heart. (Research)).
- What are the functions of each part of the human circulatory system?
- How are water and nutrients transported around the body? •
- What impact does exercise have on the human body? (Enquiry based Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. ٠ This could be achieved by using pulse meters and stop watches to record heart rate before, during and after exercise. (Observing)).
- How does a person's lifestyle affect their quality of life? (Enquiry based Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. This could be achieved by...an overview of different people's lifestyles and comment on which people would be the most likely to have certain health issues/ conditions. More formal whole class presentations to share and report findings – discussion of confidence of findings. (Research & Observing)
- Why are drugs, including alcohol and cigarettes, dangerous to our bodies?
| Theme:   | Living Things and Their Habit  |
|--|--|
| CURRICULUM AREA:   | Science  |
| FINAL OUTCOME/ ASSESSMENT OPPORTUNIT   | ГҮ   |
| (What all children will be able to talk about by the end   | of the unit)   |
| Key question: How can living things be classifie   | d?   |
| PRIOR KNOWLEDGE  | NEXT STEPS:  |
| Links to YS<br>Living Thing and Their Habitats<br>To know the differences in the life cycles of a mammal, amphibian, insect and a bird.<br>To know the life process of reproduction in some plants and animals<br>Links to Y4<br>Living Things and Their Habitats<br>To know key characteristics of plants and animals.<br>To know key characteristics of plants and animals.<br>To know averitely of living things in their local and wider environment.<br>To know averitely of living things in their local and wider environment.<br>To know types of plants – flowering van and that this can sometimes pose dangers to living things.<br>Links to Y3<br>Plants<br>To know types of plants – flowering vs non flowering<br><u>Animals inc Humans</u><br>To know types of plants – flowering vs non flowering<br><u>Animals inc Humans</u><br>To know the differences between things that are living, dead and things that have been alive.<br>To know that environ their sources of their their to a and animals in their habitats to which they are situated. To know what and plants depend on each other.<br>To know that environ their food from plants and other animals, using the idea of a simple food chain and identify and name different sources of food.<br>Links to Y1<br>Animals, including humans<br>To know carnivore, herbivores and omnivores and understand that they eat different things. | KS3 Curriculum<br><u>Relationships in an ecosystem</u><br>The interdependence of organism<br>pollinated crops.<br>The importance of plant reproduc<br>How organisms affect, and are affect<br>toxic materials. |

Knowledge

- To know a range of observable characteristics of animals, microorganisms and plants.
- To give reasons for classifying plants, animals and microorganisms based on specific characteristics.

**Enquiry Skills** 

- recording data and results of increasing complexity using tables, and classification keys. This could be achieved by... creating classification keys to describe how things are classified and justify their category based on their characteristics. -This could be achieved through dissection of plants. Use microscopes to observe micro-organisms. (Grouping & Classifying)
- identifying scientific evidence that has been used to support or refute ideas or arguments. This could be achieved by... providing children with statements from different people and the children justify using their scientific knowledge to agree or disagree with the statements.

HOOK:

Initial hook – name as many living things as they can. Nature walk around the school. Can you see all living things? Videos on microorganisms. Close up pictures – can the children identify what living thing it could be?

**VOCABULARY:** 

t	а	t	s
ι	a	ι	Э

in an ecosystem, including food webs and insect

tion through insect pollination in human food security. ected by, their environment, including the accumulation of

Micro-organism, Microbe, Decay, Exoskeleton, Endoskeleton, Bacteria, Virus, Mould

## **SMALL STEPS IN LEARNING:**

- How can animals be classified based on their similarities and differences? (Ensure children use vertebrate and invertebrate to help classify) -
- Who was Carl Linnaeus and what system did he create? -
- What is a classification key used for? (Enquiry based recording data and results of increasing complexity using tables, and classification keys. This could be achieved by... creating classification keys to describe how things are classified and justify their category based on their characteristics. This could be achieved through dissection of plants. Use microscopes to observe micro-organisms. (Grouping & Classifying)
- What are microorganisms? (Enquiry based developing mould on bread and seeing how it grows (Comparative and Fair Testing)) -
- Are all microorganisms harmful? (Enquiry based identifying scientific evidence that has been used to support or refute ideas or arguments. This could be achieved by... providing children with statements from different people and the children justify using their scientific knowledge to agree or disagree with the statements.)
- What living things can I classify in my local environment? (Enquiry based recording data and results of increasing complexity using tables, and classification keys. Using equipment to observe living things, including plants, in the local area and creating a classification key/using a classification key to identify them (Grouping and Classifying/Researching and Observing)

' Science is a living, breathing subject, constantly adapting itself to change. It is dynamic and relevant. Science is a great adventure with a purpose.' Michael Palin