



Science Curriculum

Learning as a family in Jesus, through **Love, Hope and Forgiveness**

'with God all things are possible.' Matthew 19:26

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(Shared Area - Documents\2022-2023\Subject leaders\Science\Resources in School)



Overview

Biology		Chemistry		Physics		Earth Science	
AGE PHASE	YEAR Group	AUTUMN		SPRING		SUMMER	
Whole School enrichment		Black History Month – Scientists		<ul style="list-style-type: none">Science WeekWorld Water DayWessex Water workshops with all children			
		<ul style="list-style-type: none">UKS2 Science LeadersLinks with Secondary Schools					
EYFS	R		Seasonal changes and Woodland animals habitats c.p. Resources	Observe animals and plants and explain why some things occur – talk about changes. Materials (ice and other materials) c.p. Resources	Irreversible changes Seasonal changes c.p. Resources	Floating and sinking c.p. Resources	Animals, including life cycles and Plants Seasonal changes c.p. Resources
		ELG: The Natural World c.p r.p					
KS1	1	‘ANIMALS INCLUDING HUMANS’ (Humans: Basic Structure & Senses) c.p. Resources	‘PLANTS’ Trees (Common wild and garden plants, including deciduous and evergreen trees) c.p. Resources	‘EVERYDAY MATERIALS’ c.p. Resources	‘EVERYDAY MATERIALS’ c.p. Resources	‘ANIMALS INCLUDING HUMANS’ (link to British wildlife) c.p. Resources	‘PLANTS’ Theme continued with a block at end of yr as well as throughout yr c.p. Resources
		Observe plants throughout the year					
			Observe seasonal changes (LIGHT & ASTRONOMY) throughout the year (including sunlight, weather and link with plants) - Ongoing nature display				
	2	‘ANIMALS, INCL HUMANS’ (Humans: Grow & Stay Healthy) c.p. Resources What happens to your body – identify changes.	USES OF EVERYDAY MATERIALS c.p. Resources	‘ANIMALS, INCL HUMANS’ (Animal survival and growth) c.p. Resources		‘PLANTS’ (and living things and their habitats) (Growing Plants) c.p. Resources	‘LIVING THINGS & THEIR HABITATS’ c.p. Resources
		Observe plants and animals in the local environment throughout the year					

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LKS2	3	LIGHT & ASTRONOMY <u>'LIGHT'</u> c.p. Resources	<u>'FORCES AND MAGNETS'</u> c.p. Resources	<u>'ANIMALS, INCL HUMANS'</u> (Health and Nutrition) c.p. Resources	<u>'ANIMALS, INCL HUMANS'</u> (Skeletons and Movement) c.p. Resources	<u>'PLANTS'</u> c.p. Resources	<u>'ROCKS AND FOSSILS'</u> c.p. Resources
	4	<u>'STATES OF MATTER'</u> c.p. Resources	<u>'LIVING THINGS & THEIR HABITATS'</u> c.p. Resources	<u>'ANIMALS, INCL HUMANS'</u> (Food chains) c.p. Resources	<u>'ANIMALS, INCL HUMANS'</u> (Teeth and Digestion) c.p. Resources	<u>'SOUND'</u> c.p. Resources	<u>'ELECTRICITY'</u> c.p. Resources
	Use the local environment throughout the year to identify, study and observe changes of plants and animals in their habitat						
UKS2	5	(Material Properties) <u>'PROPERTIES & CHANGES OF MATERIALS'</u> (Mixtures and separation) c.p. Resources	(Material. Changes) <u>'PROPERTIES & CHANGES OF MATERIALS'</u> (Changes) c.p. Resources	LIGHT & ASTRONOMY <u>'EARTH & SPACE'</u> c.p. Resources	<u>'FORCES'</u> c.p. Resources		<u>'LIVING THINGS & THEIR HABITATS'</u> (AND Animals, including Humans - Changes as humans develop to old age.- teach through PSHE lessons) c.p. Resources
	Observe life cycles of plants and animals in the local environment throughout the year - 'ANIMALS, INCL HUMANS'						
	6	<u>'LIVING THINGS & THEIR HABITATS'</u> (classification) c.p. Resources	<u>ELECTRICITY</u> c.p. Resources	<u>'EVOLUTION & INHERITANCE'</u> (incl. adaptations) c.p. Resources	<u>'ANIMALS, INCL HUMANS'</u> (Circulatory system and Exercise) c.p. Resources	LIGHT & ASTRONOMY <u>'LIGHT'</u> c.p. Resources	<u>'ANIMALS, INCL HUMANS'</u> (Keeping Healthy, Diet & Lifestyle) c.p. Resources



Enquiry skills

'Science enquiry is what children do in order to answer scientific questions about the world around them'. Turner et al. (2011). It's Not Fair...or is it?

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
				
<p>Observing changes that occur over a period of time ranging from minutes to months.</p> 	<p>Making observations to name, sort and organise items.</p> 	<p>Identifying patterns and looking for relationships in enquiries where variables are different to control.</p> 	<p>Using secondary sources of information to answer scientific questions.</p> 	<p>Changing one variable to see its effect on another, whilst keeping all others the same.</p> 
<p>Examples of enquiry skills in action</p>				



Working Scientifically

	EYFS	Year 1 and 2	Year 3 and 4	Year 5 and 6
Plan	<ul style="list-style-type: none"> choose the resources they need for their chosen activities and say when they do or don't need help 	<ul style="list-style-type: none"> ask simple questions and recognising that they can be answered in different ways 	<ul style="list-style-type: none"> ask relevant questions and using different types of scientific enquiries to answer them set up simple practical enquiries, comparative and fair tests 	<ul style="list-style-type: none"> plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	<ul style="list-style-type: none"> know about similarities and differences in relation to places, objects, materials and living things make observations of animals and plants explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. select and use technology for particular purposes 	<ul style="list-style-type: none"> observe closely, using simple equipment perform simple tests identify and classify 	<ul style="list-style-type: none"> make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers 	<ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Record	<ul style="list-style-type: none"> represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories 	<ul style="list-style-type: none"> gather and record data to help in answering questions. 	<ul style="list-style-type: none"> gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 	<ul style="list-style-type: none"> record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs



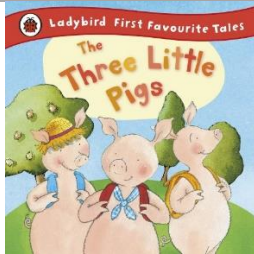
Review	<ul style="list-style-type: none"> talk about the features of their own immediate environment and how environments might vary from one another explain why some things occur and talk about changes 	<ul style="list-style-type: none"> use their observations and ideas to suggest answers to questions 	<ul style="list-style-type: none"> report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identify differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support their findings 	<ul style="list-style-type: none"> use test results to make predictions to set up further comparative and fair tests report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations identify scientific evidence that has been used to support or refute ideas or arguments
Posters for books/wall				
	Working scientifically posters			
	Details and examples on working scientifically			



EYFS

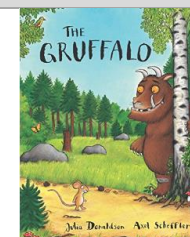


EYFS - Year R - ELG: The Natural World – Term 1

EYFS ELG Goals		Sticky Knowledge	Vocabulary
<ul style="list-style-type: none">Explore the natural world around them, making observations and drawing pictures of animals and plantsKnow some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in classUnderstand some important processes and changes in the natural world around them, including the seasons and changing states of matter.		<p><u>House building</u></p> <ul style="list-style-type: none">I can build strong structures.To know that a weak structure is something that falls down easily.I know that a strong structure can't fall down easily.	Observe, watch, record, measure, changes, strong(est), weak(est), structure, predict
			Linked Texts
			 <p>Three Little Pigs – Traditional Tale</p>
Pre School Knowledge		Key Question(s)	Future Learning
Talk about the differences between materials and changes they notice. Explore and talk about different forces they can feel. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things.		<p><u>During building:</u></p> <p>Can you predict what might happen? Do you think this will be the strongest structure? What would you build your house out of? What is going to happen next? Can you explain what has happened to our structure?</p>	TO DO
Working Scientifically			
Plan	<ul style="list-style-type: none">choose the resources they need for their chosen activities and say when they do or don't need help		
Do	<ul style="list-style-type: none">know about similarities and differences in relation to places, objects, materials and living thingsmake observations of animals and plantsexplore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.select and use technology for particular purposes		
Record	<ul style="list-style-type: none">represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories		
Review	<ul style="list-style-type: none">talk about the features of their own immediate environment and how environments might vary from one anotherexplain why some things occur and talk about changes		
Continuous Provision			



Outdoors	Malleable Play	Sensory Play	Construction	Small World	Role Play
Independent activity - Big building – construction – larger scale to what they did in class – Reasoning – talk about what they are making and why. - <i>Why have you built your structure like that?</i> Draw what they want to build.			Teacher led investigative experience - Which is the strongest material to build a house? What happens when it rains on a mud brick house? Choices between sugar cubes, Lego, sticks, hay/straw, straws tied together. Spaghetti and marshmallow. <i>What do you think will make the strongest subject?</i>		

EYFS - Year R - ELG: The Natural World – Term 2 – ‘Oh help! Oh no, it’s the Gruffalo’		
EYFS ELG Goals	Sticky Knowledge	Vocabulary
<ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. 	Noticing Autumnal changes in the seasons (leaves on the floor, colours of leaves etc.) Features of a den (sometimes underground, warm, safe)	Underground, warm, safe, leaves, autumn, season, observe, habitat, animal, plant
		Linked Text 



Pre School Knowledge	Key Questions	Future Learning
<p>Talk about the differences between materials and changes they notice.</p> <p>Explore and talk about different forces they can feel.</p> <p>Plant seeds and care for growing plants.</p> <p>Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment</p>	<p>Welly Walk: What can you see? What has changed since the Summer?</p> <p>Animal Habitat: What do animals live in? What does an animal's habitat look like? How is an animal habitat look different to a human habitat?</p>	<p>Year 1:</p> <ul style="list-style-type: none"> Observe changes across the four seasons

Working Scientifically

Plan	<ul style="list-style-type: none"> choose the resources they need for their chosen activities and say when they do or don't need help
Do	<ul style="list-style-type: none"> know about similarities and differences in relation to places, objects, materials and living things make observations of animals and plants explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. select and use technology for particular purposes
Record	<ul style="list-style-type: none"> represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories
Review	<ul style="list-style-type: none"> talk about the features of their own immediate environment and how environments might vary from one another explain why some things occur and talk about changes


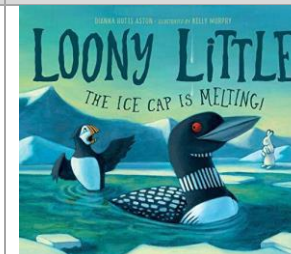
Continuous Provision & Key Questions

Outdoors	Malleable Play	Sensory Play	Construction	Small World	Role Play
<p>Welly Walk – to notice the changes in seasons – <i>Can you make five observations on your welly walk?</i></p>				<p>Building a den for a woodland animal – making observations and drawing pictures of animals and plants – <i>Can you describe an animal habitat?</i></p>	

EYFS - Year R - ELG: The Natural World – Term 3

National Curriculum Objective	Sticky Knowledge	Vocabulary
	When water is frozen it becomes ice.	



<ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. 		<p>When ice melts to becomes water.</p> <p>When the weather changes, animals go into hibernation.</p> <p>When the weather changes, some plants can't survive, some plants lose their leaves, some plants stay the same.</p> <p>Enrichment – Two substances can create a chemical reaction</p>	<p>Ice, water, changes, nature, hibernation, survive, leaves, plants, temperature</p>
		<p>Key Figure</p>  <p>Hamza Yassin – 'A Walk in the Park'</p>	<p>Linked Texts</p>  <p>Loony Little: The Ice Cap Is Melting - Kelly Murphy</p>
<p>Prior Learning</p> <p>Talk about the differences between materials and changes they notice.</p> <p>Explore and talk about different forces they can feel.</p> <p>Plant seeds and care for growing plants.</p> <p>Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment</p>		<p>Key Question(s)</p> <p>What is the weather today?</p> <p>How has the weather changed recently?</p> <p>How is this weather different from during the Summer holidays?</p> <p>What did you do in the Summer holidays? Would you do that now? Why?</p> <p>What happens to ice if the temperature is warm?</p> <p>What happens when salt comes into contact with ice?</p> <p>What happens when water gets really cold?</p>	<p>Future Learning</p> <p>Year 1:</p> <ul style="list-style-type: none"> Observe and describe weather associated with the seasons and how day length varies. <p>Year 5</p> <ul style="list-style-type: none"> Irreversible and reversible changes
<p>Working Scientifically</p>			
Plan	<ul style="list-style-type: none"> choose the resources they need for their chosen activities and say when they do or don't need help 		
Do	<ul style="list-style-type: none"> know about similarities and differences in relation to places, objects, materials and living things make observations of animals and plants explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. select and use technology for particular purposes 		
Record	<ul style="list-style-type: none"> represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories 		

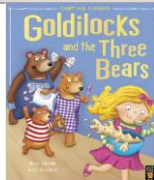


Review	<ul style="list-style-type: none">talk about the features of their own immediate environment and how environments might vary from one anotherexplain why some things occur and talk about changes				
Continuous Provision					
Outdoors	Malleable Play	Sensory Play	Construction	Small World	Role Play
<p>Observations: Observe animals and plants and explain why some things occur – talk about changes in the weather.</p> <p>Use salt on ice to see it dissolve quicker. <i>Why does Mr Lillis put salt on the playground/paths when it gets really cold?</i></p> <p>Sand volcano experiment – Enrichment – Volcanoes - bicarbonate soda and vinegar - to make a reaction that looks like lava.</p>		<p>Explore an ice mountain. Understand some important processes and changes in the natural world around them. Understand that when water is frozen it becomes ice and it then melts to become water. <i>What changes can you see happening?</i></p>			<p>News and Weather station - Know some similarities and differences between the natural world around them and contrasting environments. <i>Can you create a weather forecast?</i></p>

EYFS - Year R - ELG: The Natural World – Term 4

National Curriculum Objective	Sticky Knowledge	Vocabulary
	Noticing Winter changes in the seasons (frost on floor, no leaves on some trees, colder temperature etc.)	Frost, cold, leaves

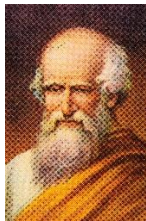
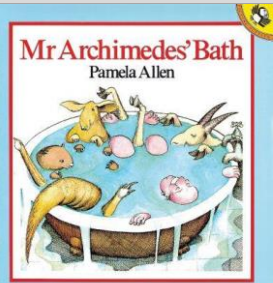


<ul style="list-style-type: none">Explore the natural world around them, making observations and drawing pictures of animals and plantsKnow some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in classUnderstand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	<p>Some changes are not reversible Water/milk is absorbed. Porridge is dry when uncooked. Cooked porridge is thick and creamy Cooked porridge has a different texture to uncooked porridge.</p>	<p>Dry, thick, creamy, texture, absorbed, reversible, irreversible Senses, nose, smell</p>			
		<p>Linked Texts</p> 			
<p>Prior Learning</p> <p>Talk about the differences between materials and changes they notice. Explore and talk about different forces they can feel. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment</p>	<p>Key Question(s)</p> <p>What do you use to smell? Can you describe when you are smelling? What has happened to the porridge? How has it changed? Why has it changed?</p>	<p>Future Learning</p> <p>TO DO</p>			
<p>Working Scientifically</p>					
<p>Plan</p>	<ul style="list-style-type: none">choose the resources they need for their chosen activities and say when they do or don't need help				
<p>Do</p>	<ul style="list-style-type: none">know about similarities and differences in relation to places, objects, materials and living thingsmake observations of animals and plantsexplore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.select and use technology for particular purposes				
<p>Record</p>	<ul style="list-style-type: none">represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories				
<p>Review</p>	<ul style="list-style-type: none">talk about the features of their own immediate environment and how environments might vary from one anotherexplain why some things occur and talk about changes				
<p>Continuous Provision</p>					
<p>Outdoors</p> <p>Welly Walk – to notice the changes in seasons – <i>Can you</i></p>	<p>Malleable Play</p> <p>Investigate smell boxes – Understand important processes <i>What can you smell?</i></p>	<p>Sensory Play</p> <p>Investigate porridge and the changes that occur when making it. – <i>What has changed</i></p>	<p>Construction</p>	<p>Small World</p>	<p>Role Play</p>



<i>make five observations on your welly walk?</i>		<i>between the porridge at the beginning and the porridge at the end?</i>			
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EYFS - Year R - ELG: The Natural World – Term 5

EYFS - Year R - ELG: The Natural World – Term 5			
National Curriculum Objective	Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none">Explore the natural world around them, making observations and drawing pictures of animals and plantsKnow some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in classUnderstand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	<p>To know that some materials float and some materials sink</p> <p>Exceeding extension – Exploring Materials float and sink depending on their shape and density</p> <p>Enrichment – some liquids float in water</p> <p>Enrichment exceeding – to know that oil is less dense than the water it was spilled into.</p>	Float, sink, buoyant, materials	
		Key Scientists	Linked Texts
		<p>Archimedes</p> 	
Prior Learning	Key Question(s)	Future Learning	
<p>Talk about the differences between materials and changes they notice.</p> <p>Explore and talk about different forces they can feel.</p> <p>Plant seeds and care for growing plants.</p> <p>Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment</p>	<p>What floats/sinks?</p> <p>Exceeding – Why do some materials float/sink?</p>		
Working Scientifically			



Plan	<ul style="list-style-type: none"> choose the resources they need for their chosen activities and say when they do or don't need help
Do	<ul style="list-style-type: none"> know about similarities and differences in relation to places, objects, materials and living things make observations of animals and plants explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. select and use technology for particular purposes
Record	<ul style="list-style-type: none"> represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories
Review	<ul style="list-style-type: none"> talk about the features of their own immediate environment and how environments might vary from one another explain why some things occur and talk about changes


Continuous Provision

Outdoors	Malleable Play	Sensory Play	Construction	Small World	Role Play
		Floating and sinking water activity – understand important processes and changes. <i>Which materials sink/float and why (GD extension – floating and sinking depending on density/shape)?</i> Enrichment - Oil and water- lava lamps – sensory bottles			Become a scientist and explore being in a science lab Explore the natural world around them. <i>What do you notice when investigating materials?</i>

EYFS - Year R - ELG: The Natural World – Term 6

National Curriculum Objective	Sticky Knowledge	Vocabulary
	Noticing Summer changes in the seasons (leaves on trees, colours of leaves, flowers blooming, green grass etc.)	Blooming, flowers, leavers, changing, colours, minibeasts, farm, wild, observe, ranger, life cycle



<ul style="list-style-type: none">Explore the natural world around them, making observations and drawing pictures of animals and plantsKnow some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in classUnderstand some important processes and changes in the natural world around them, including the seasons and changing states of matter.		Notice differences between minibeasts, farm animal and wild animals	Key Figures		Linked Texts
					
			Michaela Strachan and Chris Packham		
Prior Learning		Key Question(s)		Future Learning	
Talk about the differences between materials and changes they notice. Explore and talk about different forces they can feel. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment					
Working Scientifically					
Plan	<ul style="list-style-type: none">choose the resources they need for their chosen activities and say when they do or don't need help				
Do	<ul style="list-style-type: none">know about similarities and differences in relation to places, objects, materials and living thingsmake observations of animals and plantsexplore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.select and use technology for particular purposes				
Record	<ul style="list-style-type: none">represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories				
Review	<ul style="list-style-type: none">talk about the features of their own immediate environment and how environments might vary from one anotherexplain why some things occur and talk about changes				
Continuous Provision					
Outdoors	Malleable Play	Sensory Play	Construction	Small World	Role Play
Welly Walk – to notice the changes in seasons – <i>Can you</i>	Create the life cycle of a butterfly – Observations of	Draw and name the key features of animals and plants –	Build a wildlife park – Observations of animals – <i>What</i>		Become a wildlife ranger - Observations of animals – <i>What</i>








<i>make five observations on your welly walk?</i>	<i>animals – Can you identify the life cycle of a butterfly</i>	<i>Observations of animals and plants Can you describe the animal/plant?</i>	<i>animals have you included in your wildlife park and why?</i>		<i>would your role be as a ranger?</i>
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Year 1



KS1 - Year 1 – Term 1 - Animals, including humans

KS1 - Year 1 – Term 1 - Animals, including humans									
National Curriculum Objective		Sticky Knowledge		Vocabulary					
Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.		<ul style="list-style-type: none">To be able to identify the basic parts of the human body and find them on a diagram.Animals have senses to help individuals survive.Humans have key parts in common, but these vary from person to person.Humans have five senses – sight, touch, taste, hearing and smelling.These senses are linked to particular parts of the body.		<ul style="list-style-type: none">Senses, touch, taste, smell, hear, seehead, neck, ear, mouth, shoulder, hand, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow, tongue					
				Key Scientists					
				Linked Texts					
		Linda Brown Buck - Won a Nobel prize for her research into the nose and sense of smell.		One Year with Kipper (Mick Inkpen)					
Prior Learning		Key Question(s)		Future Learning					
In Early Years children should: <ul style="list-style-type: none">be able to identify different parts of their body.Have some understanding of healthy food and the need for variety in their diets. 📄Be able to show care and concern for living things. 📄Know the effects exercise has on their bodies.Have some understanding of growth and change. 📄Can talk about things they have observed including animals		<ul style="list-style-type: none">Which of our senses is the most accurate at identifying food?What are the five senses and what body part is linked to each one?Can you show me where your head is?Can you show me where your ears are? What do they help you do?		In Year 2 children will: 📄 <ul style="list-style-type: none">Know that animals, including humans, have offspring which grow into adults 📄Know the basic stages in a life cycle for animals, including humans. 📄Find out and describe the basic needs of animals, including humans, for survival (water, food and air). 📄 Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.					
Working Scientifically									
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways								
Do	<ul style="list-style-type: none">observe closely, using simple equipmentperform simple testsidentify and classify								
Record	<ul style="list-style-type: none">gather and record data to help in answering questions.								
Review	<ul style="list-style-type: none">use their observations and ideas to suggest answers to questions								
Enquiry Skills									
Observing over time		Identifying and classifying		Pattern seeking		Research		Comparative and fair testing	
		Learning the names of main body parts through games, actions, songs and rhymes		Look for patterns between people e.g. Do		How do senses help us survive? – Animals smelling prey, hearing prey coming, seeing prey coming		Investigate human senses e.g. Which part of my body is good for feeling, which is not? Which	








	-‘Heads, shoulders, knees and toes’ song	people with big hands have big feet? Talk about their findings from investigations using appropriate vocabulary e.g. “My fingers are much better at feeling than my toes” “We found that the crisps all taste the same.”		food/flavours can I identify by taste? Which smells can I match?
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KSI - Year 1 – Term 2a/4a/6a - Seasons and How they Change (Teach this across the year)

National Curriculum Objective		Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none">Observe changes across the four seasonsObserve and describe weather associated with the seasons and how day length varies.	<ul style="list-style-type: none">Weather can changeThere are lots of different types of weather: Rain, Sun, Cloud, Wind, Snow, etcDays (sunrise to sunset) are longer and hotter in the summerDays (sunrise to sunset) are shorter and colder in the winterThere are four seasons: Spring, Summer, Autumn, WinterThe change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. <p>Common misconceptions:</p> <ul style="list-style-type: none">it always snows in winterit is always sunny in the summerthere are only flowers in spring and summerit rains most in the winter.	<ul style="list-style-type: none">Seasons, spring, summer, autumn, winter, windy, sunny, overcast, snowy, rainy, temperatureSun, sunrise, sunset, day length	Key Scientists	Linked Texts
			<p>Dr Steve Lyons (Extreme Weather)</p> <p>Holly Green (Meteorologist)</p>	<p>Tree: Seasons Come, Seasons Go (Patricia Hegarty and Britta Teckentrup)</p> <p>One Year with Kipper (Mick Inkpen)</p> <p>After the Storm (Nick Butterworth)</p>
Prior Learning		Key Question(s)	Future Learning	
<p>In Early Years children should:</p> <ul style="list-style-type: none">Developing an understanding of change.Observe and explain why certain things may occur (e.g. leaves falling off trees, weather changes).Look closely at similarities, differences, patterns and change.Comments and questions about the place they live or the natural world.		<ul style="list-style-type: none">How does rainfall and temperature change over time in our school grounds?Why do you think leaves turn brown in Winter?What colours can we find outside? Does this change across the seasons?What changes happen in Spring/Summer/Autumn/Winter?	<p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)</p> <ul style="list-style-type: none">Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space)The seasons and the Earth’s tilt, day length at different times of year, in different hemispheres. (KS3)	
Working Scientifically				
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways			
Do	observe closely, using simple equipment perform simple tests			



	<ul style="list-style-type: none">• identify and classify			
Record	<ul style="list-style-type: none">• gather and record data to help in answering questions.			
Review	<ul style="list-style-type: none">• use their observations and ideas to suggest answers to questions			
Enquiry Skills				
<div>Observing over time</div> <div></div>	<div>Identifying and classifying</div> <div></div>	<div>Pattern seeking</div> <div></div>	<div>Research</div> <div></div>	<div>Comparative and fair testing</div> <div></div>
<div>Links to plants:</div> <div>Keep small display of things found on walk (fallen leaves, conkers etc. to then compare to other walks, comparing to buds opening. Take pictures of any flowers that will not keep for display)</div> <div>Collect information about the weather regularly throughout the year.</div> <div><ul style="list-style-type: none">• Present this information in tables and charts to compare the weather across the seasons.• Collect information, regularly throughout the year, of features that change with the seasons e.g. plants, animals, humans.• Present this information in different ways to compare the seasons.• Gather data about day length regularly throughout the year and present this to compare the seasons.</div>			<div>Differences in animal habitats through the seasons</div> <div>Animal habitats</div> <div>Winter: Links to animals including humans: Hedgehogs – Hedgehogs and their winter habitat – how to return them safely to their habitat</div>	
<div>Lesson ideas:</div>	<div>Use the evidence gathered to describe the general types of weather and changes in day length over the seasons.</div> <div><ul style="list-style-type: none">• Use their evidence to describe some other features of their surroundings, e.g. themselves, animals, plants that change over the seasons• Demonstrate their knowledge in different ways e.g. making a weather forecast video, writing seasonal poetry, creating seasonal artwork</div>			






KS1 - Year 1 – Term 2b - Plants			
National Curriculum Objective	Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and name the roots, trunk, branches and leaves of trees. 	<ul style="list-style-type: none"> Plants grow from seeds/bulbs Plants need light and water to grow and survive Plants are important We can eat lots of plants Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring. 	<ul style="list-style-type: none"> deciduous, evergreen Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area 	
		Key Scientists	Linked Texts



	<p>Misconceptions - Some children may think:</p> <ul style="list-style-type: none">plants are flowering plants grown in pots with coloured petals.trees are not plantsall leaves are greenall stems are greena trunk is not a stemblossom is not a flower.	Beatrix Potter (Author & Botanist)	<p><i>Tree: Seasons Come, Seasons Go</i> (Patricia Hegarty and Britta Teckentrup)</p> <p><i>A Little Guide to Wild Flowers</i> (Charlotte Voake)</p> <p><i>The Things That I LOVE about TREES</i> (Chris Butterworth)</p>	
Prior Learning	Key Question(s)	Future Learning		
<p>In EYFS Children should:</p> <ul style="list-style-type: none">Make observations of plantsKnow some names of plants, trees and flowersMay be able to name and describe different plants, trees and flowers <p>Show some care for their world around them</p> <p>Explore the world around them.</p>	<ul style="list-style-type: none">How do Plants grow?What do Plants need to grow?Do all plants need water?Are all plants green?Why do seeds look different?Can plants grow as big in the shade?	<ul style="list-style-type: none">Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants)Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants)Investigate the way in which water is transported within plants. (Y3 - Plants)		
Working Scientifically				
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways			
Do	<p>observe closely, using simple equipment</p> <p>perform simple tests</p> <ul style="list-style-type: none">identify and classify			
Record	<ul style="list-style-type: none">gather and record data to help in answering questions.			
Review	<ul style="list-style-type: none">use their observations and ideas to suggest answers to questions			
Enquiry Skills				
Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
<ul style="list-style-type: none">Make close observations of leaves, seeds, flowers etc.Make observations of how plants change over a period of time.Can use photographs to talk about how plants change over time	<ul style="list-style-type: none">Compare two leaves, seeds, flowers etc.Classify leaves, seeds, flowers etc. using a range of characteristics.Identify plants by matching them to named images.	<ul style="list-style-type: none">Can sort and group parts of plants using similarities and differencesCan use simple charts etc. to identify plantsCan collect information on features that change during the year		



KS1 - Year 1 – Term 3 and 4 - Materials






National Curriculum Objective		Sticky Knowledge		Vocabulary							
<ul style="list-style-type: none">Distinguish between an object and the material from which it is made.Identify and name a variety of everyday materials, including wood, metal, plastic, glass, water and rock,Describe the simple physical properties of a variety of everyday materials.Compare and group together a variety of everyday materials based on their simple properties		<ul style="list-style-type: none">To be able to describe different materials using the vocabulary to describe their properties.To group materials depending on their properties (metals, rocks, fabrics, wood, plastic and ceramics (including glass))The properties of a material determine whether they are suitable for a purpose<ul style="list-style-type: none">All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. <p>Common misconceptions:</p> <ul style="list-style-type: none">only fabrics are materialsonly building materials are materials‘solid’ is another word for hard.		<p>Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through</p> <table><tr><th>Key Scientists</th><th>Linked Texts</th></tr><tr><td>William Addis (Toothbrush Inventor)</td><td><i>The Great Paper Caper</i> (Oliver Jeffers)</td></tr><tr><td>Charles Mackintosh (Waterproof coat) - pre-teach for Year 2</td><td><i>Who Sank the Boat</i> (Pamela Allen)</td></tr></table>		Key Scientists	Linked Texts	William Addis (Toothbrush Inventor)	<i>The Great Paper Caper</i> (Oliver Jeffers)	Charles Mackintosh (Waterproof coat) - pre-teach for Year 2	<i>Who Sank the Boat</i> (Pamela Allen)
Key Scientists	Linked Texts										
William Addis (Toothbrush Inventor)	<i>The Great Paper Caper</i> (Oliver Jeffers)										
Charles Mackintosh (Waterproof coat) - pre-teach for Year 2	<i>Who Sank the Boat</i> (Pamela Allen)										
Prior Learning		Key Question(s)		Future Learning							
<p>In Early Years children should:</p> <ul style="list-style-type: none">be able to ask questions about the place they live.Talk about why things happen and how things work.Discuss the things they have observed such as natural and found objects.Manipulates materials to achieve a planned effect. <p>Structure</p> <p>What makes the strongest structure and why? They used sugar cubes, straws,</p>		<p><u>Clothing & Materials</u> Which material could be used to make a waterproof hat for the teacher when she is on the playground at playtime? Which plastic would be flexible enough to make a belt? What could I wrap a chicken egg in to keep it warm when it is waiting to hatch?</p> <p><u>Buildings</u> Which materials absorb the most water? Which type of brick would be the easiest to drag to make a pyramid? Which material would be the strongest to use as a floor tile?</p> <p><u>Toys & Nice things</u> Which fabric would make the softest blanket? The baby has spilt her drink, which material would absorb the drink the best? We want to make a really slippery slide; which liquid would be best to use? Which wrapping papers are strong enough to wrap and send a present?</p>		<p>In Year 2 children will:</p> <ul style="list-style-type: none">Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. <p>Find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>							
Working Scientifically											
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways										
Do	<ul style="list-style-type: none">observe closely, using simple equipmentperform simple testsidentify and classify										
Record	<ul style="list-style-type: none">gather and record data to help in answering questions.										
Review	<ul style="list-style-type: none">use their observations and ideas to suggest answers to questions										
Enquiry Skills											
Observing over time		Identifying and classifying		Pattern seeking		Research		Comparative and fair testing			
		Pupils should explore and experiment with a wide variety of materials including for example: brick, paper, fabrics, elastics, foil.				<ul style="list-style-type: none">Can use their test evidence to answer the questions about properties e.g. “Which cloth is the most absorbent?”		Comparing materials Eg. someone who does gymnastics and can do the split. Show them some gym leggings and let children feel and stretch. Show children non-stretch trousers. Experiment - do the			



	<ul style="list-style-type: none"> • Classify objects made of one material in different ways e.g. a group of object made of metal. • Classify in different ways one type of object made from a range of materials e.g. a collection of spoons made of different materials. • Classify materials based on their properties. • Test the properties of objects e.g. absorbency of cloths, strength of party hats made of different papers, stiffness of paper plates, waterproofness of shelters <p>Working scientifically to explore questions like: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf ...for a gymnast's leotard?</p> <p>Term 1: End point - Design what plane Amy Johnson would use...what materials would they use for the seat, the wings, the propeller? What would her uniform be made out of? Does it need to keep her warm? Keep her cool?</p>			<p>splits in leggings, stiff trousers. Class discussion on why gymnasts would use stretchy material to perform in.</p>
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KS1 - Year 1 – Term 5 - Animals, including humans

KS1 - Year 1 – Term 5 - Animals, including humans					
National Curriculum Objective		Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none">identify and name a variety of common animals including fish, amphibians, reptiles, mammals and birdsidentify and name a variety of common animals that are carnivores, herbivores and omnivoresdescribe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)		<ul style="list-style-type: none">There are many different animals with different characteristics.Animals need food to survive.Animals need a variety of food to help them grow, repair their bodies, be active and stay healthy. <p><u>Common misconceptions:</u></p> <ul style="list-style-type: none">only four-legged mammals, such as pets, are animalshumans are not animalsinsects are not animalsall ‘bugs’ or ‘creepy crawlies’, such as spiders, are part of the insect groupamphibians and reptiles are the same		<ul style="list-style-type: none">Amphibians, birds, fish, mammals, reptiles, carnivores, herbivore, omnivore, pet	
				<table><tr><th>Key Scientists</th><th>Linked Texts</th></tr><tr><td>Chris Packham (Animal Conservationist)</td><td><i>One Year with Kipper</i> (Mick Inkpen) Snail Trail (Ruth Brown) Superworm (Julia Donaldson & Axel Scheffler)</td></tr></table>	
Key Scientists	Linked Texts				
Chris Packham (Animal Conservationist)	<i>One Year with Kipper</i> (Mick Inkpen) Snail Trail (Ruth Brown) Superworm (Julia Donaldson & Axel Scheffler)				
Prior Learning		Key Question(s)		Future Learning	
<p>In Early Years children should:</p> <ul style="list-style-type: none">be able to identify different parts of their body.Have some understanding of healthy food and the need for variety in their diets. ☐Be able to show care and concern for living things. ☐Know the effects exercise has on their bodies.Have some understanding of growth and change. ☐Can talk about things they have observed including animals		<ul style="list-style-type: none">What do animals eat?Do all animals eat the same food?Which of our senses is the most accurate at identifying food?Do all animals hunt?Why are animals different colours and patterns?		<p>In Year 2 children will: ☐</p> <ul style="list-style-type: none">Know that animals, including humans, have offspring which grow into adults ☐Know the basic stages in a life cycle for animals, including humans. ☐Find out and describe the basic needs of animals, including humans, for survival (water, food and air). ☐ <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	
Working Scientifically					
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways				
Do	<ul style="list-style-type: none">observe closely, using simple equipmentperform simple testsidentify and classify				
Record	<ul style="list-style-type: none">gather and record data to help in answering questions.				
Review	<ul style="list-style-type: none">use their observations and ideas to suggest answers to questions				
Enquiry Skills					
Observing over time 	Identifying and classifying 	Pattern seeking 	Research 	Comparative and fair testing 	
<p>Marwell Zoo –Make first-hand, close observations of animals from each of the groups.</p> <ul style="list-style-type: none">Make first-hand close observations of parts of the body e.g. hands, eyes.	<p>Marwell Zoo – Classify animals/humans using a range of features.</p> <p>Comparing and contrasting animals first hand or through videos or photographs</p> <p>Identify animals by matching them to named images.</p> <ul style="list-style-type: none">Classify animals according to what they eat.<ul style="list-style-type: none">What their enclosure smells like	<p>Marwell Zoo – Look for patterns between people e.g. Do people with big hands have big feet?</p> <p>Look for patterns between where groups of animals live.</p>	<p>Marwell Zoo – Research of animals from different groups.</p> <ul style="list-style-type: none">Investigate human senses e.g. Which part of my body is good for feeling, which is not? Which food/flavours can I identify by taste? Which smells can I match	<ul style="list-style-type: none">Compare two animals from the same or different groups.Compare two people.Take measurements of parts of their body.	



KSI - Year 1 – Term 6 – Plants

KSI - Year 1 – Term 6 – Plants					
National Curriculum Objective		Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none">Identify and describe the basic structure of a variety of common flowering plants.Identify and name the roots, trunk, branches and leaves of trees – repeated from Term 2.		<ul style="list-style-type: none">Plants grow from seeds/bulbsPlants need light and water to grow and survivePlants are importantWe can eat lots of plants <p><u>Misconceptions - Some children may think:</u></p> <ul style="list-style-type: none">plants are flowering plants grown in pots with coloured petals.trees are not plantsall leaves are greenall stems are greena trunk is not a stemblossom is not a flower.		Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, blossom, petals, fruit	
				Key Scientists	Linked Texts
				Beatrix Potter (Author & Botanist)	<p><i>Tree: Seasons Come, Seasons Go</i> (Patricia Hegarty and Britta Teckentrup)</p> <p><i>A Little Guide to Wild Flowers</i> (Charlotte Voake)</p> <p><i>The Things That I LOVE about TREES</i> (Chris Butterworth)</p> <p><i>Harry's Hazelnut</i> (Ruth Parsons)</p>
Prior Learning		Key Question(s)		Future Learning	
<p>In EYFS Children should:</p> <ul style="list-style-type: none">Make observations of plantsKnow some names of plants, trees and flowersMay be able to name and describe different plants, trees and flowers <p>Show some care for their world around them</p>		<ul style="list-style-type: none">How do Plants grow?What do Plants need to grow?Do all plants need water?Are all plants green?Why do seeds look different?Can plants grow as big in the shade?What is the biggest/smallest/smelliest (etc) tree/flower/plant on the planet?		<p>In Year 2 Children will:</p> <ul style="list-style-type: none">Observe and describe how seeds and bulbs grow into mature plants. <p>Find out and describe how plants need water, light and warmth to grow and stay healthy.</p>	
Working Scientifically					
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways				
Do	<ul style="list-style-type: none">observe closely, using simple equipmentperform simple testsidentify and classify				
Record	<ul style="list-style-type: none">gather and record data to help in answering questions.				
Review	<ul style="list-style-type: none">use their observations and ideas to suggest answers to questions				
Enquiry Skills					
Observing over time		Identifying and classifying		Pattern seeking	
				Research	
				Comparative and fair testing	








<p>Make observations of how plants change over a period of time.</p> <p>Make close observations of leaves, seeds, flowers <u>using magnifying glasses</u> etc.</p>	<p>Classify leaves, seeds, flowers etc. using a range of characteristics.</p> <p>Identify plants by matching them to named images.</p> <p><u>Disect a plant</u>, drawing diagrams showing the parts of different plants including trees.</p>			<p>Compare two leaves, seeds, flowers etc.</p> <p>Comparing and contrasting familiar plants.</p>
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Year 2








KS1 - Year 2 – Term 1 - Animals, including humans

KS1 - Year 2 – Term 1 - Animals, including humans					
National Curriculum Objective		Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none">Know the (NS: basic stages in a life cycle for humans and that) humans have offspring which grow into adults.Find out and describe the basic needs of humans, for survival (water, food and air).Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.		<ul style="list-style-type: none">Exercise keeps humans’ bodies in good condition and helps to increase length of life.All humans eventually die.Humans grow until maturity and then do not grow any larger.Humans need to eat, drink and breathe air to stay alive.		Living, dead, food, mature, exercise, hygiene	
				<div>Key ScientistsLinked Texts</div>	
				Joe Wicks (Personal Trainer) <i>I Can Eat a Rainbow</i> (Olana Rose)	
Prior Learning		Key Question(s)		Future Learning	
<p>In Year 1 children should: ☐</p> <ul style="list-style-type: none">Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. ☐ <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p>		<ul style="list-style-type: none">How long do should my pets live for?Do all animals grow and live the same way?Do bigger animals live longer?Why are we all different heights?How and why do we grow and change?		<p>In Year 3 children will: ☐</p> <ul style="list-style-type: none">Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. ☐Know how nutrients, water and oxygen are transported within animals and humans.Know about the importance of a nutritious, balanced diet. ☐ <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement:</p>	
Working Scientifically					
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways				
Do	<ul style="list-style-type: none">observe closely, using simple equipmentperform simple testsidentify and classify				
Record	<ul style="list-style-type: none">gather and record data to help in answering questions.				
Review	<ul style="list-style-type: none">use their observations and ideas to suggest answers to questions				
Enquiry Skills					
Observing over time		Identifying and classifying		Pattern seeking	
				Research	
				Comparative and fair testing	



KS1 - Year 2 – Term 2 - Materials

National Curriculum Objective		Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none">Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.Find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		<ul style="list-style-type: none">Materials can be changed by physical force (twisting, bending, squashing and stretching)		Waterproof, fabric, rubber, cars, rock, paper, cardboard, wood, metal, plastic, glass, brick, twisting, squashing, bending, cans, spoons,	
				<div>Key ScientistsLinked Texts</div>	
				<div>William Addis (Toothbrush Inventor) Charles Mackintosh (Waterproof coat) John McAdam (roads) <i>The Tin Forest (Helen Ward)</i> <i>Traction Man (Mini Grey)</i> <i>Three Little Pigs (Lesley Sims)</i></div>	
Prior Learning		Key Question(s)		Future Learning	
<p>In Year 1 children should:</p> <ul style="list-style-type: none">Distinguish between and object and the material from which it is made.Identify and name a variety of everyday materials, including wood, metal, plastic, glass, water and rock, Describe the simple physical properties of a variety of everyday materials.Compare and group together a variety of everyday materials based on their simple properties.		<p>It is recommended that materials be taught three times through KS1. Give a theme for each topic e.g. buildings, exploration, toys, the seaside. Plan to investigate a couple of classes of materials and properties in each topic so children get a depth of experience each topic and cover all the classes of materials over the key stage. Which one for this topic?</p> <div><div><u>Buildings</u> Which rocks are the least crumbly? Which materials absorb the most water? Which type of brick would be the easiest to drag to make a pyramid? Which material would be the strongest to use as a floor tile?</div><div><u>Toys & Nice things</u> Which fabric would make the softest blanket? The baby has spilt her drink, which material would absorb the drink the best? We want to make a really slippery slide; which liquid would be best to use? Which chocolate will melt the fastest on a warm plate (a model of a warm hand) Which wrapping papers are strong enough to wrap and send a present?</div><div><u>Clothing & Materials</u> Which material could be used to make a waterproof hat for the teacher when she is on the playground at playtime? Which plastic would be flexible enough to make a belt? Which material could I wrap my ice egg / snowman in to stop it melting, or would it make it melt quicker? What could I wrap a chicken egg in to keep it warm when it is waiting to hatch? What could you paint on the runaway gingerbread man that would allow him to swim the river and get away from the fox and not turn to mush?</div></div>		<p>In Year 3 children will:</p> <ul style="list-style-type: none">Compare and group together different kinds of rocks based on their appearance and simple physical propertiesDescribe in simple terms how fossils are formed when things that have lived are trapped within rock <p>Recognise that soils are made from rocks and organic matter.</p>	
Working Scientifically					
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways				
Do	<ul style="list-style-type: none">observe closely, using simple equipmentperform simple testsidentify and classify				
Record	<ul style="list-style-type: none">gather and record data to help in answering questions.				
Review	<ul style="list-style-type: none">use their observations and ideas to suggest answers to questions				
Enquiry Skills					
Observing over time		Identifying and classifying		Pattern seeking	
				Research	
				Comparative and fair testing	
Curly Wurly stretching					








KS1 - Year 2 – Term 3 - Animals, including humans

National Curriculum Objective		Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none">Know that animals have offspring which grow into adults.NS: Know the basic stages in a life cycle for animals.Find out and describe the basic needs of animals for survival (water, food and air).		<ul style="list-style-type: none">Animals move in order to survive.Different animals move in different ways to help them survive.All animals eventually die.Animals reproduce new animals when they reach maturity.Animals grow until maturity and then do not grow any larger		Living, dead, never alive, habitats, micro-habitats, food, food chain	
				Key Scientists	Linked Texts
				Steve Irwin (Crocodile Hunter)	<i>Meerkat Mail</i> (Emily Gravett) <i>Tadpole's Promise</i> (Jeanne Willis and Tony Ross)
Prior Learning		Key Question(s)		Future Learning	
<p>In Year 1 children should: </p> <ul style="list-style-type: none">Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p>		<ul style="list-style-type: none">How long should my pets live for?Do all animals grow and live the same way?Do bigger animals live longer?Why are we all different heights?How and why do we grow and change?Why do we move?		<p>In Year 3 children will: </p> <ul style="list-style-type: none">Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. Know how nutrients, water and oxygen are transported within animals and humans.Know about the importance of a nutritious, balanced diet. <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement:</p>	
Working Scientifically					
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways				
Do	<ul style="list-style-type: none">observe closely, using simple equipmentperform simple testsidentify and classify				
Record	<ul style="list-style-type: none">gather and record data to help in answering questions.				
Review	<ul style="list-style-type: none">use their observations and ideas to suggest answers to questions				
Enquiry Skills					
Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing	
Observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.		Noticing similarites and differences between different life cycles: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult.	EOBA – Research and create a flow chart (differentiated: describe, draw pictures, label) of an animal they have studied or a favourite animal of their choice.		








KS1 - Year 2 – Term 5 – Plants and Living things and their habitats

KS1 - Year 2 – Term 5 – Plants and Living things and their habitats									
National Curriculum Objective		Sticky Knowledge		Vocabulary					
<ul style="list-style-type: none">Observe and describe how seeds and bulbs grow into mature plants.Find out and describe how plants need water, light and warmth to grow and stay healthy.Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of plants, and how they depend on each other.Identify and name a variety of plants in their habitats, including micro habitats.		<ul style="list-style-type: none">Plants grow from seeds/bulbsPlants need light, water and warmth to grow and surviveFlowers make seeds to make more plants (reproduce)Plants are importantWe need plants to survive (to clean air, to eat) We can eat different parts of the plants (leaves, stems, roots, seeds, fruit)		Leaves, trunk, branch, root, seed, bulb, flower, stem, wild, garden, deciduous, evergreen, observe, grow, compare, record, temperature, predict, measure, diagram, germinate, warmth, sunlight.					
				Key Scientists	Linked Texts				
		Agnes Arber (Botanist)		<i>The Tin Forest</i> (Helen Ward)					
		Alan Titchmarsh (Botanist & Gardener)		<i>Jack and the Beanstalk</i> (Richard Walker)					
Prior Learning		Key Question(s)		Future Learning					
<p>In Year 1 Children should:</p> <ul style="list-style-type: none">Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.Identify and describe the basic structure of a variety of common flowering plants.Identify and name the roots, trunk, branches and leaves of trees.		<ul style="list-style-type: none">Do cress produce seeds, how could we find out?Do all plants produce flowers and seeds?What is different between freshly cut and planted flowers?Do plants flower all year round?What are flowers for?What happens to a plant after it has produced seeds?		<p>In Year 3 Children will:</p> <ul style="list-style-type: none">Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowersExplore the part flowers play in a flowering plant's life cycle, including pollination, seed formation and seed dispersalExplain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants<ul style="list-style-type: none">Know the way in which water is transported between plants					
Working Scientifically									
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways								
Do	<ul style="list-style-type: none">observe closely, using simple equipmentperform simple testsidentify and classify								
Record	<ul style="list-style-type: none">gather and record data to help in answering questions.								
Review	<ul style="list-style-type: none">use their observations and ideas to suggest answers to questions								
Enquiry Skills									
Observing over time		Identifying and classifying		Pattern seeking		Research		Comparative and fair testing	



KS1 - Year 2 – Term 6 – Living Things and Their Habitats






National Curriculum Objective		Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none">Explore and compare the difference between things that are living, dead and things that have never been alive.(Recap from Term 5) Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals, and how they depend on each other.(Recap from Term 5) Identify and name a variety of animals in their habitats, including micro habitats.Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.		<ul style="list-style-type: none">Some things are living, some were once living but now dead and some things never lived.There is variation between living things.Different animals and plants live in different places. Living things are adapted to survive in different habitats.Environmental change can affect plants and animals that live there.		Living, dead, never alive, habitats, micro-habitats, food, food chain	
Key Scientists		Linked Texts			
Terry Nutkins (TV Presenter)		Liz Bonnin (Conservationist)		<p><i>The Gruffalo</i> (Julia Donaldson)</p> <p><i>Meerkat Mail</i> (Emily Gravett)</p> <p><i>No Place Like Home</i> (Jonathon Emmett)</p>	
Prior Learning		Key Question(s)		Future Learning	
<p>In Early Years children should:</p> <ul style="list-style-type: none">Comments and questions about the place they live or the natural world.Shows care and concern for living things and the environment.Can talk about things they have observed such as plants and animals.Notices features of objects in their environment. <p>Comments and asks questions about their familiar world.</p>		<ul style="list-style-type: none">How to animals eat?Do all animals eat the same thing?Which animals hunt, and which animals are hunted? Why?What animals live in our school environment?How are animals and plants ‘adapted’ to live in their habitatsWhy do animals and plants like to live in different places?How do seasons affect our animals and plants?Which animals hibernate and why?Why do snails hibernate, but slugs do not?How to habitats change over our school year?		<p>In Year 4 children will: ☑</p> <ul style="list-style-type: none">Recognise that living things can be grouped in a variety of ways.Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.Know and label the features of a river <p>Recognise that environments can change and that this can sometimes pose danger to living things.</p>	
Working Scientifically					
Plan	<ul style="list-style-type: none">ask simple questions and recognising that they can be answered in different ways				
Do	<ul style="list-style-type: none">observe closely, using simple equipmentperform simple testsidentify and classify				
Record	<ul style="list-style-type: none">gather and record data to help in answering questions.				
Review	<ul style="list-style-type: none">use their observations and ideas to suggest answers to questions				
Enquiry Skills					
Observing over time		Identifying and classifying		Pattern seeking	
Research				Comparative and fair testing	
					



Year 3



LKS2 – Year 3 – Term 1 - Light

National Curriculum Objective		Sticky Knowledge		Vocabulary	
<ul style="list-style-type: none">Recognise that they need light in order to see things and that dark is the absence of light.Notice that light is reflected from surfaces.Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.Recognise that shadows are formed when the light from a light source is blocked by a solid object.Find patterns in the way that the sizes of shadows change.		<ul style="list-style-type: none">There must be light for us to see. Without light it is dark.We need light to see things even shiny things.Transparent materials let light travel through them, and opaque materials don't let light through.Beams of light bounce off some materials (reflection).Shiny materials reflect light beams better than non-shiny materials. Light comes from a source		Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent.	
				Key Scientists	Linked Texts
				James Clerk Maxwell (Visible and Invisible Waves of Light)	The Owl Who Was Afraid of the Dark (Jill Tomlinson) The Dark (Lemony Snicket)
Prior Learning		Key Question(s)		Future Learning	
<p>In Year 1 children should have:</p> <ul style="list-style-type: none">Observed changes across the four seasonsObserved and describe weather associated with the seasons and how day length varies.		<ul style="list-style-type: none">A coin is lost, what would be the best way to find it? (Turn the lights out and see it shine? Use a torch to see it reflect?)How does distance from a light source affect how bright it looks?How does being in darkness affect your sense of hearing?What colour would be the best to make a safety jacket from?How does the colour of a material affect how reflective it is?What would be the best material to make a blind for a baby's room?How does thickness of a material affect how much light can pass through it?		<p>In Year 6 children will:</p> <ul style="list-style-type: none">Recognise that light appears to travel in straight lines.Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.	
Working Scientifically					
Plan	<ul style="list-style-type: none">ask relevant questions and using different types of scientific enquiries to answer themset up simple practical enquiries, comparative and fair tests				
Do	<ul style="list-style-type: none">make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers				
Record	<ul style="list-style-type: none">gather, record, classify and present data in a variety of ways to help in answering questionsrecord findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables				
Review	<ul style="list-style-type: none">report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusionsuse results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questionsidentify differences, similarities or changes related to simple scientific ideas and processesuse straightforward scientific evidence to answer questions or to support their findings				
Enquiry Skills					
Observing over time		Identifying and classifying		Pattern seeking	
				Research	
				Comparative and fair testing	
				Research and build equipment to look at the sun (Prepare risk assessment in folder) Shadows and torches – how shadows are formed?	



LKS2 – Year 3 – Term 2 - Forces and Magnets








National Curriculum Objective		Sticky Knowledge	Vocabulary		
<ul style="list-style-type: none">• Compare how things move on different surfaces.• Notice that some forces need contact between two objects, but magnetic forces can act at a distance.• Observe how magnets attract and repel each other and attract some materials and not others.• Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials.• Describe magnets as having two poles.• Predict whether two magnets will attract or repel each other, depending on which poles are facing.		<ul style="list-style-type: none">• Magnets exert attractive and repulsive forces on each other.• Magnets exert non-contact forces, which work through some materials.• Magnets exert attractive forces on some materials. Magnet forces are affected by magnet strength, object mass, distance from object and object material.	Key Scientists		Linked Texts
			William Gilbert (Theories on Magnetism)		The Iron Man (Ted Hughes)
			Andre Marie Ampere (Founder of Electro-Magnetism)		Mrs Armitage: Queen of the Road (Quentin Blake)
Prior Learning		Key Question(s)		Future Learning	
<p>In Year 2 children:</p> <ul style="list-style-type: none">• May have an awareness of how to make things stop and start, using simple pushes and pulls. <p>They may know about floating and sinking.</p>		<ul style="list-style-type: none">• What are magnetic materials? How can we find out?• Can I make a magnetic material non-magnetic?• How far away does a magnet have to be before it attracts a magnetic material?• How far away can the magnetic attraction between two magnets be experienced?• Is the repulsive force the same size?• How is the magnetic attraction of repulsion force affected by putting materials between the magnets?• Are bigger magnets stronger?• How could you use magnets to measure the number of pages in a book?		<p>In Year 5 children will:</p> <ul style="list-style-type: none">• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object and the impact of gravity on our lives.• Identify the effects of air resistance, water resistance and friction, which act between moving surfaces.• Recognise that some mechanisms, including levers, pulleys, and gears, allow a smaller force to have a greater effect.• Describe the movement of the Earth, and other planets, relative to the Sun in the solar system• Describe the movement of the Moon relative to the Earth• Describe the Sun, Earth and Moon as approximately spherical bodies• Describe the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
Working Scientifically					
Plan	<ul style="list-style-type: none">• ask relevant questions and using different types of scientific enquiries to answer them• set up simple practical enquiries, comparative and fair tests				
Do	<ul style="list-style-type: none">• make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers				
Record	<ul style="list-style-type: none">• gather, record, classify and present data in a variety of ways to help in answering questions• record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables				
Review	<ul style="list-style-type: none">• report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions• use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions• identify differences, similarities or changes related to simple scientific ideas and processes• use straightforward scientific evidence to answer questions or to support their findings				
Enquiry Skills					








Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
				Test how far a car rolls on different surfaces and the force needed to make it roll



LKS2 – Year 3 – Term 3 and 4 - Animals, including Humans

National Curriculum Objective		Sticky Knowledge	Vocabulary		
<u>Term 3 - Skeletons and Movement</u> <ul style="list-style-type: none">Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Non-statutory: <ul style="list-style-type: none">Introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions <u>Term 4 - Health and Nutrition</u> <ul style="list-style-type: none">Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. Non-statutory: <ul style="list-style-type: none">Know about the importance of a nutritious, balanced diet.Introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions.		<u>Term 3 - Skeletons and Movement</u> <ul style="list-style-type: none">Many animals have skeletons to support their bodies and protect vital organs.Muscles are connected to bones and move them when they contract.Movable joints connect bones.Children should be able to name the main body parts associated with the skeleton and musclesDifferent parts of the body have special functions. <u>Term 4 - Health and Nutrition</u> <ul style="list-style-type: none">Different animals are adapted to eat different foods.Nutrition is important for a healthy body	<u>Term 3 - Skeletons and Movement</u> Skeleton, bones, joints, endoskeleton, exoskeleton, vertebrates, invertebrates, muscles, contract, relax, <u>Term 4 - Health and Nutrition</u> Nutrients, nutrition, carbohydrates, protein, fats, vitamins, minerals, water, fibre		
Prior Learning		Key Question(s)	Key Scientists		Linked Texts
In Year 2 children should:  <ul style="list-style-type: none">Know that animals, including humans, have offspring which grow into adults Know the basic stages in a life cycle for animals, including humans. Find out and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.		<ul style="list-style-type: none">Why do we need a skeleton?What types of skeleton are there?Are all skeletons the same?Can something survive without a skeleton?What happens if we break a bone?How do we move?Are bones that are bigger, stronger?Why do we need joints?Why do muscles get tired?Can we ‘break’ muscles?	Adelle Davis (20 th Century Nutritionist)		<i>The Story of Frog Belly Rat Bone</i> (Timothy Basil Ering)
			Marie Curie (Radiation / X-Rays)		<i>Funnybones</i> (Janet and Allan Ahlberg)
					<i>I Will Never Not Ever Eat a Tomato</i> (Lauren Child)
Prior Learning		Key Question(s)	Future Learning		
In Year 2 children should:  <ul style="list-style-type: none">Know that animals, including humans, have offspring which grow into adults Know the basic stages in a life cycle for animals, including humans. Find out and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.		<ul style="list-style-type: none">Why do we need a skeleton?What types of skeleton are there?Are all skeletons the same?Can something survive without a skeleton?What happens if we break a bone?How do we move?Are bones that are bigger, stronger?Why do we need joints?Why do muscles get tired?Can we ‘break’ muscles?	In Year 4 children will:  <ul style="list-style-type: none">Describe the simple functions of the basic parts of the digestive system in humans.Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey		
Working Scientifically					
Plan	<ul style="list-style-type: none">ask relevant questions and using different types of scientific enquiries to answer themset up simple practical enquiries, comparative and fair tests				
Do	<ul style="list-style-type: none">make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers				
Record	<ul style="list-style-type: none">gather, record, classify and present data in a variety of ways to help in answering questionsrecord findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables				
Review	<ul style="list-style-type: none">report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusionsuse results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questionsidentify differences, similarities or changes related to simple scientific ideas and processesuse straightforward scientific evidence to answer questions or to support their findings				



Enquiry Skills				
Observing over time 	Identifying and classifying 	Pattern seeking 	Research 	Comparative and fair testing 
	Term 3 - Identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons.			Term 4 - Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy, and design meals based on what they find out.

LKS2 – Year 3 – Term 5 - Plants		
National Curriculum Objective	Sticky Knowledge	Vocabulary



<ul style="list-style-type: none">Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowersExplore the part flowers play in a flowering plants life cycle, including pollination, seed formation and seed dispersalExplain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plantsInvestigate the way in which water is transported between plants		<ul style="list-style-type: none">Plants are producers, they make their own food.Their leaves absorb sunlight and carbon dioxidePlants have roots, which provide support and draw water from the soilFlowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed productionSeed dispersal improves a plants chances of successful reproductionSeeds/bulbs require the right conditions to germinate and grow.Seeds contain enough food for the plant's initial growth	Air, light, water, nutrients, soil, support, anchor, reproduction, pollination, dispersal, transportation, flower, energy, growth, seedling, carbon dioxide, oxygen, sugar, material, photosynthesis, chlorophyll						
			<table><tr><th>Key Scientists</th><th>Linked Texts</th></tr><tr><td>Jan Ingenhousz (Photosynthesis)</td><td><i>Earth Shattering Events</i> <i>Robin Jacobs (Star book)</i></td></tr><tr><td>Joseph Banks (Botanist)</td><td><i>George and Flora's Secret Garden</i> <i>(Jo Elworthy)</i></td></tr></table>	Key Scientists	Linked Texts	Jan Ingenhousz (Photosynthesis)	<i>Earth Shattering Events</i> <i>Robin Jacobs (Star book)</i>	Joseph Banks (Botanist)	<i>George and Flora's Secret Garden</i> <i>(Jo Elworthy)</i>
Key Scientists	Linked Texts								
Jan Ingenhousz (Photosynthesis)	<i>Earth Shattering Events</i> <i>Robin Jacobs (Star book)</i>								
Joseph Banks (Botanist)	<i>George and Flora's Secret Garden</i> <i>(Jo Elworthy)</i>								
Prior Learning		Key Question(s)	Future Learning						
<p>In Year 2 Children should:</p> <ul style="list-style-type: none">Observe and describe how seeds and bulbs grow into mature plants.Find out and describe how plants need water, light and warmth to grow and stay healthy.		<ul style="list-style-type: none">How do plants reproduce?Do all flowers look the same?How do insects know which flowers to pollinate?Why do flowers smell?What do seeds do?Can a plant live without its leaves?Do grass/trees make flowers?What conditions are perfect for a seed to grow?Where do weeds come from?How does the space between seeds affect how well they grow?Does seed size match plant size?Do plants take in water through their roots?How does water move through the plant?How do plants make their food?How does light affect plant growth?How does a plant get carbon dioxide?	<p>In Year 6 Children will:</p> <ul style="list-style-type: none">Recognise that living things have changed over time and that fossils provide information about living thingsRecognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parentsIdentify how animals and plants are adapted to suit their environment in different ways, and that adaptation can lead to evolution.						
Working Scientifically									
Plan	<ul style="list-style-type: none">ask relevant questions and using different types of scientific enquiries to answer themset up simple practical enquiries, comparative and fair tests								
Do	<ul style="list-style-type: none">make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers								
Record	<ul style="list-style-type: none">gather, record, classify and present data in a variety of ways to help in answering questionsrecord findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables								
Review	<ul style="list-style-type: none">report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusionsuse results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questionsidentify differences, similarities or changes related to simple scientific ideas and processesuse straightforward scientific evidence to answer questions or to support their findings								
Enquiry Skills									








Observing over time		Identifying and classifying		Pattern seeking		Research		Comparative and fair testing	
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LKS2 – Year 3 – Term 6 – Materials (Rocks and Fossils)

National Curriculum Objective		Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none">Compare and group together different kinds of rocks based on their appearance and simple physical propertiesDescribe in simple terms how fossils are formed when things that have lived are trapped within rockRecognise that soils are made from rocks and organic matter		<ul style="list-style-type: none">There are different types of rock.There are different types of soil.Soils change over time.Different plants grow in different soils.Fossils tell us what has happened before.Fossils provide evidence.Palaeontologists use Fossils to find out about the past.Fossils provide evidence that living things have changed over time.	Rocks, igneous, metamorphic, sedimentary, anthropic, permeable, impermeable, chemical fossil, body fossil, trace fossil, Mary Anning, cast fossil, mould fossil, replacement fossil, extinct, organic matter, topsoil, sub soil, base rock.	
			Key Scientists	Linked Texts
			Mary Anning (Discovery of Fossils)	<i>The Pebble in My Pocket</i> (Meredith Hooper)
			Inge Lehmann (Earth’s Mantle)	<i>Stone Girl, Bone Girl</i> (Laurence Anholt)
				<i>The Street Beneath My Feet</i> (Charlotte Guillain & Yuval Zommer)
Prior Learning		Key Question(s)	Future Learning	
<p>In Year 2 children should:</p> <ul style="list-style-type: none">Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.Find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. <p>Children may:</p> <ul style="list-style-type: none">May have some understanding of a variety of different rocks in the natural world.Some understanding of what soil is. (how to identify soil etc)May have some knowledge of what a fossil is.		<ul style="list-style-type: none">How are the soils different?Which do you think has best drainage?Which is more likely to lead to flooding?How many soil types have we found?Where might you find more?How might the soil be different in different countries?What rock is best for a kitchen chopping board? What might be the issues with various materials and what they must withstand?What types of rocks are there?How do rocks change?What would grow best in your soil?Why do you think worms are important to the creation of soil?How can we use composting to make our own soil?Does it currently look like real soil?How long do you think this process will take and why?How are fossils created?Why do fossils help us find out about historical events?If you could fossilise an object what would it be?	<p>In Year 4 children will:</p> <ul style="list-style-type: none">Compare and group materials together, according to whether they are solids, liquids or gases.Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius.Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <p>In Year 6 children will: Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p>	
Working Scientifically				
Plan	<ul style="list-style-type: none">ask relevant questions and using different types of scientific enquiries to answer themset up simple practical enquiries, comparative and fair tests			
Do	<ul style="list-style-type: none">make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers			
Record	<ul style="list-style-type: none">gather, record, classify and present data in a variety of ways to help in answering questions			



	<ul style="list-style-type: none">record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables				
Review	<ul style="list-style-type: none">report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusionsuse results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questionsidentify differences, similarities or changes related to simple scientific ideas and processesuse straightforward scientific evidence to answer questions or to support their findings				
Enquiry Skills					
Observing over time		Identifying and classifying		Pattern seeking	
				Research	
				Looking at different types of rocks and materials	Comparative and fair testing
					



Year 4








LKS2 – Year 4 – Term 1 - States of Matter – Solids, Liquids and Gases

National Curriculum Objective		Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none">Compare and group materials together, according to whether they are solids, liquids or gases.Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius.Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		<ul style="list-style-type: none">Solids, liquids and gases are described by observable properties.Materials can be divided into solids, liquids and gases.Heating causes solids to melt into liquids and liquids evaporate into gases. d) Cooling causes gases to condense into liquids and liquids to freeze into solids.The temperature at which given substances change state are always the same.	Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection,	
			Key Scientists	
			<div>Anders Celsius (Celsius Temperature Scale)</div> <div>Daniel Fahrenheit (Fahrenheit Temperature Scale / Invention of the Thermometer)</div>	
			<div>Once Upon a Raindrop: The Story of Water (James Carter)</div> <div>Sticks (Diane Alber)</div>	
Prior Learning		Key Question(s)	Future Learning	
<p>In KS1 children should:</p> <ul style="list-style-type: none">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.Describe the simple physical properties of a variety of everyday materials.Compare and group together a variety of everyday materials based on their simple physical properties.Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		<ul style="list-style-type: none">How does the amount of water added to flour affect its state?How does the amount of detergent added to water affect how slippery it is?How does the temperature affect how viscous a liquid is (use cooking oil)?Place a peach in a glass of lemonade and watch it spin. Why does it behave that way, and can you prove it?How does the material sprinkled on ice and snow affect how quickly it melts?What chocolate would be best to smuggle? How does the type of chocolate affect its melting temperature?What is the melting temperature of ice and how does it compare with the freezing temperature of water?Is the melting temperature of wax the same as its freezing temperature?	<p>In Year 5 children will:</p> <ul style="list-style-type: none">Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.Use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.Give reasons based on evidence from comparative and fair tests, for the uses of everyday materials, including wood, metals and plastic.Demonstrate that dissolving, mixing and changes of state are reversible changes. <p>Explain that some changes result in the formation of new materials, and this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p>	
Working Scientifically				
Plan	<ul style="list-style-type: none">ask relevant questions and using different types of scientific enquiries to answer themset up simple practical enquiries, comparative and fair tests			
Do	<ul style="list-style-type: none">make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers			
Record	<ul style="list-style-type: none">gather, record, classify and present data in a variety of ways to help in answering questionsrecord findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables			
Review	<ul style="list-style-type: none">report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions			



- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings

Enquiry Skills

Observing over time 	Identifying and classifying 	Pattern seeking 	Research 	Comparative and fair testing 
<ul style="list-style-type: none"> • Heating chocolate • Melting ice • Butter on toast • Making toast • Cold plate over boiled kettle (risk assessment) 				

National Curriculum Objective	Sticky Knowledge	Vocabulary
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<ul style="list-style-type: none">• Recognise that living things can be grouped in a variety of ways.• Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. <ul style="list-style-type: none">• Recognise that environments can change and that this can sometimes pose danger to living things.		<ul style="list-style-type: none">• Living things can be divided into groups based upon their characteristics• Environmental change affects different habitats differently• Different organisms are affected differently by environmental change• Different food chains occur in different habitats<ul style="list-style-type: none">Human activity significantly affects the environment	Environment, flowering, nonflowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation.
		Key Scientists	Linked Texts
		Cindy Looy (Environmental Change and Extinction) Jaques Cousteau (Marine Biologist)	<i>The Vanishing Rainforest</i> (Richard Platt) <i>The Morning I Met a Whale</i> (Michael Morpurgo) <i>Journey to the River Sea</i> (Eva Ibbotson)
Prior Learning		Key Question(s)	
In Year 2, children should: <ul style="list-style-type: none">• Explore and compare the difference between things that are living, dead and things that have never been alive.• Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.• Identify and name a variety of plants and animals in their habitats, including micro habitats.• Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name the different sources of food.		<ul style="list-style-type: none">• What food chains and webs are there in our local habitat?• How does energy move through the food chain?• How does removal of one species from an environment, affect others? (keystone species)• How does environmental change affect different organisms?• What are the most important things we could do to improve our outside area? (big hotels, pond, compost, wildflowers)• How does human activity affect our environment (ferries on the Solent? Sandown Airport? KFC?)	
		Future Learning	
In Year 5: <ul style="list-style-type: none">• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.• Describe the life process of reproduction in some plants and animals.			
Working Scientifically			
Plan	<ul style="list-style-type: none">• ask relevant questions and using different types of scientific enquiries to answer them• set up simple practical enquiries, comparative and fair tests		
Do	<ul style="list-style-type: none">• make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers		
Record	<ul style="list-style-type: none">• gather, record, classify and present data in a variety of ways to help in answering questions• record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables		
Review	<ul style="list-style-type: none">• report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions• use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions• identify differences, similarities or changes related to simple scientific ideas and processes• use straightforward scientific evidence to answer questions or to support their findings		
Enquiry Skills			








Observing over time 	Identifying and classifying 	Pattern seeking 	Research 	Comparative and fair testing 
	Sorting and classifying Liquorice			



LKS2 – Year 4 – Term 3 and 4 – Animals, including humans

National Curriculum Objective		Sticky Knowledge		Vocabulary			
<p>Term 3:</p> <ul style="list-style-type: none">Construct and interpret a variety of food chains, identifying producers, predators and prey <p>Term 4:</p> <ul style="list-style-type: none">Describe the simple functions of the basic parts of the digestive system in humans.Identify the different types of teeth in humans and their simple functions		<p>Term 3:</p> <ul style="list-style-type: none">Nutrients produced by plants move to primary consumers then to secondary consumers through food chains.Predators eat prey.Some animals do not eat plants and some animals do. <p>Term 4:</p> <ul style="list-style-type: none">Animals have teeth to help them eat.Different types of teeth do different jobs.Food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood.The blood takes nutrients around the body.		Term 3: Herbivore, Carnivore, producer, consumer, predator, prey Term 4: Digestive system, tongue, mouth, teeth, oesophagus, stomach, small intestine, pancreas, large intestine, liver, tooth, canine, incisor, molar, premolar,			
				Key Scientists		Linked Texts	
				<p>Ivan Pavlov (Digestive System Mechanisms)</p> <p>Joseph Lister (Discovered Antiseptics)</p>		<p><i>Human Body Odyssey</i> (Werner Holzwarth)</p> <p><i>Crocodiles Don't Brush Their Teeth</i> (Colin Fancy)</p> <p><i>Wolves</i> (Emily Gravett)</p>	
Prior Learning		Key Question(s)		Future Learning			
<p>In Year 3 children should: ☐</p> <ul style="list-style-type: none">Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat. ☐Know how nutrients, water and oxygen are transported within animals and humans.Know about the importance of a nutritious, balanced diet. ☐ <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p>		<ul style="list-style-type: none">What different types of food are there?Why do we need a variety of different foods?Do all organisms eat the same things?Why do some people need different diets? (weightlifter vs marathon runner)Why are teeth important?What happens to our food?What is our digestive system?How does our food turn into poo and wee?		<p>In Year 5 children will: ☐</p> <ul style="list-style-type: none">Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird.Know the differences between different life cycles.Know the process of reproduction in plants. Know the process of reproduction in animals			
Working Scientifically							
Plan	<ul style="list-style-type: none">ask relevant questions and using different types of scientific enquiries to answer themset up simple practical enquiries, comparative and fair tests						
Do	<ul style="list-style-type: none">make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers						
Record	<ul style="list-style-type: none">gather, record, classify and present data in a variety of ways to help in answering questionsrecord findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables						
Review	<ul style="list-style-type: none">report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusionsuse results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questionsidentify differences, similarities or changes related to simple scientific ideas and processesuse straightforward scientific evidence to answer questions or to support their findings						
Enquiry Skills							



Observing over time 	Identifying and classifying 	Pattern seeking 	Research 	Comparative and fair testing 
<p>Term 4 - 'Make your own poo!' demonstration</p>	<p>Term 4 - Identify the main body parts associated with the digestive system, for example: mouth, tongue, teeth, oesophagus, stomach, and small and large intestine, and explore questions that help them to understand their special functions.</p>	<p>Term 3 – Looking at different flow charts of food chains – what are the differences, what are the similarities</p>	<p>Term 3 – What are the different types of producers.</p> <p>Term 4 – Researching the different stages of the digestion system and the special features of each part of the system.</p> <p>Term 4 - Marshmallow teeth experiment – what is this experiment?</p> <p>Term 4 - Finding out what damages teeth and how to look after them.</p>	<p>Term 3 – Compare which animals eat plants and which animals eat meat and why they think this. What different features do animals have if they eat meat – links to teeth for next term.</p> <p>Term 4 - Comparing the teeth of carnivores and herbivores and suggesting reasons for differences</p> <p>Term 4 - Draw and discuss their ideas about the digestive system and compare them with models or images.</p>



LKS2 – Year 4 – Term 5 - Sound

National Curriculum Objective	Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none"> • identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it • recognise that sounds get fainter as the distance from the sound source increases 	<ul style="list-style-type: none"> • Sound travels from its source in all directions and we hear it when it travels to our ears. • Sound travel can be blocked. • Sound spreads out as it travels. • Changing the shape, size and material of an object will change the sound it produces. • Sound is produced when an object vibrates. • Sound moves through all materials by making them vibrate. • Changing the way an object vibrates changes its sound. • Bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds. • Faster vibrations (higher frequencies) produce higher pitched sounds 	Amplitude, volume, quiet, loud, ear, pitch, high, low, particles, instruments, wave.	
		Key Scientists Aristotle (Sound Waves) Gailileo Galilei (Frequency and Pitch of Sound Waves) Alexander Graham Bell (Invented the Telephone)	Linked Texts Horrid Henry Rocks (Francesca Simon) Moonbird (Joyce Dunbar) The Pied Piper of Hamelin (Natalia Vasquez)
Prior Learning	Key Question(s)	Future Learning	
In KS1 children: <ul style="list-style-type: none"> • May have some understanding that objects make different sounds. • Some understanding that they use their ears to hear sounds. • Know about their different senses. 	<ul style="list-style-type: none"> • How can you change the volume of a sound? • How does the size of an ear trumpet affect the volume of sound detected? • How does the type of material affect how well it blocks a sound? • How does thickness of material affect how well it blocks a sound? • Which materials vibrate better and produce louder sounds? Can we identify any patterns? • Which materials make the best string telephone components? (tin cans, paper cups, plastic cups, wire, cable, string, plastic or elastic – predict and test) 	In KS3 children will learn about: <ul style="list-style-type: none"> • frequencies of sound waves measured in hertz (Hz), echoes, reflection and absorption of sound • sound needs a medium to travel, the speed of sound in air, in water, in solids • sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal • auditory range of humans and animals. 	








- How does length of the tube (when making a straw oboe) affect the pitch and volume?
- Can you predict the relative pitch of tuning forks from the patterns of ripples they make in the water?
-

Working Scientifically

Plan	<ul style="list-style-type: none"> • ask relevant questions and using different types of scientific enquiries to answer them • set up simple practical enquiries, comparative and fair tests
Do	<ul style="list-style-type: none"> • make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers
Record	<ul style="list-style-type: none"> • gather, record, classify and present data in a variety of ways to help in answering questions • record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
Review	<ul style="list-style-type: none"> • report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identify differences, similarities or changes related to simple scientific ideas and processes • use straightforward scientific evidence to answer questions or to support their findings

Enquiry Skills

Observing over time		Identifying and classifying		Pattern seeking		Research		Comparative and fair testing	
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LKS2 – Year 4 – Term 6 – Electricity

National Curriculum Objective	Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none"> Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes the circuit and associate this with whether a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors. <p>Non – statutory:</p> <ul style="list-style-type: none"> Know the difference between a conductor and an insulator, giving examples of each. Safety when using electricity. 	<ul style="list-style-type: none"> A source of electricity (mains or battery) is needed for electrical devices to work. Electricity sources push electricity round a circuit. More batteries will push the electricity round the circuit faster. Devices work harder when more electricity goes through them. A complete circuit is needed for electricity to flow and devices to work. <p>Some materials allow electricity to flow easily and these are called conductors. Materials that don't allow electricity to flow easily are called insulators.</p>	Electricity, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator, component.	
		Key Scientists	Linked Texts
		<p>Thomas Edison (First Working Lightbulb)</p> <p>Joseph Swan (Incandescent Light Bulb)</p>	<p>Wallace and Grommit</p> <p>Oscar and the Bird: A Book about Electricity (Geoff Waring)</p> <p>Electrical Wizard: How Nikola Tesla Lit Up the World (Elizabeth Rusch)</p>
Prior Learning	Key Question(s)	Future Learning	
<p>In Early Years children:</p> <ul style="list-style-type: none"> May have some understanding that objects need electricity to work. May understand that a switch will turn something on or off. 	<ul style="list-style-type: none"> What would life be like without electricity? What sorts of things use/need electricity? What electricity do I use? In which ways can we 'get' electricity? (mains/plugs/batteries/wireless) How do we make electricity? How do batteries work? 	<p>In Year 6 children will:</p> <ul style="list-style-type: none"> Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	



- How quickly can batteries run out? Does this make a difference depending on number of components?
- How does the number of batteries added to the circuit affect a device?
- What materials can carry electricity? (conductors/insulators)
-

Working Scientifically

Plan	<ul style="list-style-type: none"> ask relevant questions and using different types of scientific enquiries to answer them set up simple practical enquiries, comparative and fair tests
Do	<ul style="list-style-type: none"> make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers
Record	<ul style="list-style-type: none"> gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
Review	<ul style="list-style-type: none"> report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identify differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support their findings

Enquiry Skills

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
		Testing for conductors and insulators	Make own torches	



Year 5



UKS2 – Year 5 – Term 1 - Properties & Changes Of Materials (Mixtures and Separation)

UKS2 – Year 5 – Term 1 - Properties & Changes Of Materials (Mixtures and Separation)																				
National Curriculum Objective	Sticky Knowledge	Vocabulary																		
<ul style="list-style-type: none">Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.Use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.	<ul style="list-style-type: none">When two or more substances are mixed and remain present the mixture can be separated.Some changes can be reversed, and some cannot.Materials change state by heating and cooling.	Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection,																		
	<table><tr><th>Separating technique</th><th>Difference in property required</th></tr><tr><td>Filtration and sieving</td><td>A solid that does not dissolve in a liquid. Different sized solid bits</td></tr><tr><td>Magnets</td><td>Some materials magnetic others not</td></tr><tr><td>Evaporation</td><td>A solid dissolved in water and the solid has a high boiling temperature</td></tr><tr><td>Floating</td><td>Some materials float and other sink</td></tr></table>	Separating technique	Difference in property required	Filtration and sieving	A solid that does not dissolve in a liquid. Different sized solid bits	Magnets	Some materials magnetic others not	Evaporation	A solid dissolved in water and the solid has a high boiling temperature	Floating	Some materials float and other sink	<table><tr><th>Key Scientists</th><th>Linked Texts</th></tr><tr><td>Spencer Silver, Arthur Fry and Alan Amron (Post-It Notes)</td><td><i>Itch</i> (Simon Mayo)</td></tr><tr><td>Ruth Benerito (Wrinkle-Free Cotton)</td><td><i>Kensuke's Kingdom</i> (Michael Morpurgo)</td></tr><tr><td></td><td><i>The BFG</i> (Roald Dahl)</td></tr></table>	Key Scientists	Linked Texts	Spencer Silver, Arthur Fry and Alan Amron (Post-It Notes)	<i>Itch</i> (Simon Mayo)	Ruth Benerito (Wrinkle-Free Cotton)	<i>Kensuke's Kingdom</i> (Michael Morpurgo)		<i>The BFG</i> (Roald Dahl)
	Separating technique	Difference in property required																		
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Spencer Silver, Arthur Fry and Alan Amron (Post-It Notes)	<i>Itch</i> (Simon Mayo)																			
Ruth Benerito (Wrinkle-Free Cotton)	<i>Kensuke's Kingdom</i> (Michael Morpurgo)																			
	<i>The BFG</i> (Roald Dahl)																			
Prior Learning	Key Question(s)	Future Learning																		
<p>In KS1 children should:</p> <ul style="list-style-type: none">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.	<ul style="list-style-type: none">What are mixtures?What does dissolve mean?Which of the following dissolve in water: sugar, bicarbonate of soda, oil, chocolate, coffees, dark vinegar and wax?How does the amount of water used affect how much sugar will dissolve in it?Which sweets dissolve in water?	<p>In Year 5 children will:</p> <ul style="list-style-type: none">Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.																		



- Describe the simple physical properties of a variety of everyday materials.
- Compare and group together a variety of everyday materials based on their simple physical properties.
- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

- How can we separate mixtures?
- How can we clean our dirty water?






- Give reasons based on evidence from comparative and fair tests, for the uses of everyday materials, including wood, metals and plastic.
- Demonstrate that dissolving, mixing and changes of state are reversible changes.

Explain that some changes result in the formation of new materials, and this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda

Working Scientifically

Plan	<ul style="list-style-type: none"> • plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	<ul style="list-style-type: none"> • take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Record	<ul style="list-style-type: none"> • record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Review	<ul style="list-style-type: none"> • use test results to make predictions to set up further comparative and fair tests • report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • identify scientific evidence that has been used to support or refute ideas or arguments

Enquiry Skills

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
				
		Soluble solution – try to make water by Separating different sized rocks with sieves, down to trying to make clear water by using paper towels	Find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton.	



UKS2 – Year 5 – Term 2 - Properties & Changes Of Materials (Changes)

National Curriculum Objective	Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none"> Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda 	<ul style="list-style-type: none"> All matter (including gas) has mass. Sometimes mixed substances react to make a new substance. These changes are usually irreversible. Heating can sometimes cause materials to change permanently. When this happens, a new substance is made. These changes are not reversible. Indicators that something new has been made are: The properties of the material are different (colour, state, texture, hardness, smell, temperature) <p>If it is not possible to get the material back easily it is likely that it is not there anymore and something new has been made (irreversible change)</p>	Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing Material, conductor, dissolve, insoluble, suspension, chemical, physical, irreversible, solution, reversible, separate, mixture, insulator, transparent, flexible, permeable, soluble, property, magnetic, hard.	
		Key Scientists	Linked Texts
		<p>Spencer Silver, Arthur Fry and Alan Amron (Post-It Notes)</p> <p>Ruth Benerito (Wrinkle-Free Cotton)</p>	<p><i>Itch</i> (Simon Mayo)</p> <p><i>Kensuke's Kingdom</i> (Michael Morpurgo)</p> <p><i>The BFG</i> (Roald Dahl)</p>
Prior Learning	Key Question(s)	Future Learning	
<p>In Year 4 children should:</p> <ul style="list-style-type: none"> Compare and group materials together, according to whether they are solids, liquids or gases. 	<ul style="list-style-type: none"> The key question we want children to interrogate is "have we made a new substance?" <ul style="list-style-type: none"> Wet clay → air-dried clay → fired clay. Flour and water → dough → bread 	<p>In KS3 children will learn about:</p> <ul style="list-style-type: none"> the concept of a pure substance mixtures, including dissolving diffusion in terms of the particle model simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography 	



- **Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius.**
- **Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.**






- Add sugar to fizzy water; it fizzes up. Has a new substance been made? (No, the gas was dissolved in the water and adding sugar made it become undissolved)
- Add baking powder to vinegar, it fizzes up. Has a new substance been made? (Yes, the gas was not in the vinegar as it was not fizzy, so it must have been made)
- Add water to instant snow.
- Use lemon juice as an invisible ink, heating gently makes the ink visible. Is this a new substance?
- When water is added to jelly and it is set, is it a new substance.
- When materials are heated or mixed with other materials they sometimes can be made to turn into new materials. The question is how would we know if it was a new material or the same material mixed differently?
-

the identification of pure substances

Working Scientifically

Plan	<ul style="list-style-type: none"> • plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	<ul style="list-style-type: none"> • take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Record	<ul style="list-style-type: none"> • record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Review	<ul style="list-style-type: none"> • use test results to make predictions to set up further comparative and fair tests • report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • identify scientific evidence that has been used to support or refute ideas or arguments

Enquiry Skills

Observing over time		Identifying and classifying		Pattern seeking		Research		Comparative and fair testing	
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UKS2 – Year 5 – Term 3 – Earth and Space

National Curriculum Objective	Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none"> Describe the movement of the Earth, and other planets, relative to the Sun in the solar system Describe the movement of the Moon relative to the Earth Describe the Sun, Earth and Moon as approximately spherical bodies Describe the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 	<ul style="list-style-type: none"> Stars, planets and moons have so much mass they attract other things, including each other due to a force called gravity. Gravity works over distance. Objects with larger masses exert bigger gravitational forces. Objects like planets, moons and stars spin. Smaller mass objects like planets orbit large mass objects like stars. Stars produce vast amounts of heat and light. All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars. The sun is a star The sun has 8 planets orbiting it: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). The moon orbits the earth <p>Misconception: The moon is a light source</p> <p>Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses.</p>	Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric.	
		Key Scientists Neil Armstrong (First man on the Moon) Helen Sharman (First British astronaut) Tim Peake (First British ESA astronaut)	Linked Texts <i>The Skies Above My Eyes</i> (Charlotte Guillain & Yuval Zommer) <i>George's Secret Key to the Universe</i> (Lucy and Stephen Hawking with Christophe Galfard) <i>Story time from Space – books read in space by Astronauts -</i> https://storytimefromspace.com/
Prior Learning	Key Question(s)	Future Learning	
In Key Stage 1 and in Year 3 children should: <ul style="list-style-type: none"> Understand changes in weather patterns and seasons. Compare how things move on different surfaces. 	How does temperature/size/day length/year length change as you get closer/further to the sun?	In KS3 children will learn about: <ul style="list-style-type: none"> Gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; 	

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<ul style="list-style-type: none"> Notice that some forces need contact between two objects, but magnetic forces can act at a distance. <p>Describe magnets as having two poles. Predict whether two magnets with attract or repel each other, depending on which poles are facing</p>	<p>How does distance from a light source affect how much light hits an object? Does having more moons result in more light hitting a planet? How could you test this?</p> <p>How does speed/size of a meteorite affect the size of the moon crater formed? If the moon became heavier as a result of meteorite collisions what would happen to its position relative to Earth?</p> <p>If the mass of the Earth is 80x that of the moon, why is the gravity at the Earth's surface only 6x greater than at the surface of the moon?</p> <p>Why do we have day/night/months/years/seasons?</p> <p>Why does day length change?</p> <p>Why does shadow size change over the course of a day?</p>	<p>gravity forces between Earth and Moon, and between Earth and Sun (qualitative only)</p> <ul style="list-style-type: none"> Our Sun as a star, other stars in our galaxy, other galaxies <p>The seasons and the Earth's tilt, day length at different times of year, in different hemispheres the light year as a unit of astronomical distance</p>
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Working Scientifically

Plan	<ul style="list-style-type: none"> plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	<ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Record	<ul style="list-style-type: none"> record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Review	<ul style="list-style-type: none"> use test results to make predictions to set up further comparative and fair tests report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations identify scientific evidence that has been used to support or refute ideas or arguments

Enquiry Skills

Observing over time 	Identifying and classifying 	Pattern seeking 	Research 	Comparative and fair testing 
<p>Stargazing trip –I.S.S, Venus, Moon – large telescopes.</p> <p>Take iPads and use stargazing app to find other constellations</p>	<p>‘Borrow my Moon’ – must be booked a year in advance</p> <p>Children can make up own mnemonic – (My Very Easy Method Just Speeds Up Nothing or Naming Planets – as long as they remember Pluto is a dwarf planet)</p>		<p>Which planets have moons? (Earth has 1 moon; Jupiter has 4 large moons and numerous smaller ones).</p> <p>Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus.</p>	<p>Comparing the time of day at different places on the Earth through internet links and direct communication (Use New Year and the different celebrations are fireworks displays at different times)</p> <p>Creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day.</p> <p>Scientifically thinking and problem solving: Why do some people think that structures such as Stonehenge might have been used as astronomical clocks?</p>
Enrichment	<p>Winchester Science museum trip</p> <p>Animals in Space talk with Copper the dog</p> <p>Expert talk about space with Mr Nimmo</p> <p>Space and Sky talk from Mr Brown Senior</p>			



UKS2 – Year 5 – Term 4 and 5 - Forces

National Curriculum Objective	Sticky Knowledge	Vocabulary	
<p>Term 4: Identify the effects of air resistance, water resistance and friction, which act between moving surfaces. Recognise that some mechanisms, including levers, pulleys, and gears, allow a smaller force to have a greater effect.</p> <p>Term 5: Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object and the impact of gravity on our lives.</p> <p>●</p>	<p>Term 4: Air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way. Friction is a force against motion caused by two surfaces rubbing against each other. Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move</p> <p>Term 5: What goes up, must come down</p>	<p>Term 4: Air resistance, Water resistance, Friction, Gears, Pulleys, force, push, pull, opposing, streamline, brake, mechanism, lever, cog, machine, pulley. Term 5: Gravity, Newton</p>	
		<p>Key Scientists</p> <p>Galileo Galilei (Gravity and Acceleration)</p> <p>Isaac Newton (Gravitation)</p> <p>Archimedes of Syracuse</p>	<p>Linked Texts</p> <p>The Enormous Turnip (Katie Daynes)</p> <p>Leonardo's Dream (Hans de Beer)</p> <p>The Aerodynamics of Biscuits</p>

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UKS2 – Year 5 – Term 6 – Living Things and Their Habitats AND Animals, including Humans

National Curriculum Objective	Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none"> Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird. Know the process of reproduction in plants. Know the process of reproduction in animals. Describe the changes as humans develop to old age 	<ul style="list-style-type: none"> Different animals mature at different rates and live to different ages. Some organisms reproduce sexually where offspring inherit information from both parents. Some organisms reproduce asexually by making a copy of a single parent. Environmental change can affect how well an organism is suited to its environment. Different types of organisms have different lifecycles. Different animals mature at different rates and live to different ages. Puberty is something we all go through, a process which prepares our bodies for being adults, and reproduction Hormones control these changes, which can be physical and/or emotional. 	<p>Reproduction, Sexual, Asexual, Pollination, Dispersal, reproduction, cell, fertilisation, pollination, male, female, pregnancy, young, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant</p> <p>Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Hormone, Physical, Emotional,</p>	
		Key Scientists	Linked Texts
		<p>David Attenborough (Naturalist and Nature Documentary Broadcaster)</p> <p>Dr Steve Jones (Geneticist)</p>	<p><i>The Land of Neverbelieve</i> (Norman Messenger)</p> <p><i>You're Only Old Once!</i> (Dr. Seuss)</p>



Year 6



UKS2 – Year 6 – Term 1 - Living things and their habitats

National Curriculum Objective	Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none"> Classify living things into broad groups according to observable characteristics and based on similarities and differences. Give reasons for classifying plants and animals based on specific characteristics. 	<ul style="list-style-type: none"> Variation exists within a population (and between offspring of some plants) – NB: this Key Idea is duplicated in Year 6 Evolution and Inheritance. Organisms best suited to their environment are more likely to survive long enough to reproduce. Organisms are best adapted to reproduce are more likely to do so. Organisms reproduce and offspring have similar characteristic patterns. <p>Competition exists for resources and mates.</p>	Variation Organisms Populations. Classification Characteristics Environment, flowering, nonflowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation. Classify, compare, bacteria, microorganism, organism, invertebrates, vertebrates, Linnaean.	
		Key Scientists	Linked Texts
		Carl Linnaeus (Identifying, Naming and Classifying Organisms)	Beetle Boy <i>(M G Leonard)</i> Insect Soup <i>(Barry Louis Polisar)</i> Fur and Feathers <i>(Janet Halfmann)</i>
Prior Learning	Key Question(s)	Future Learning	
In Year 4, children should: <ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose danger to living things.	<ul style="list-style-type: none"> Why do we need to classify living things? How do we classify? What are the difficulties with classification? (penguins, whales, platypus) How do animals change over time? Why does variation exist? What happens if animals of different species breed? (hybrids) What happens to house plants outside? What are microorganisms? How can we prevent the spread of disease? 	In Key Stage 3 children will learn about: <ul style="list-style-type: none"> the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere the adaptations of leaves for photosynthesis. the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops 	



- Why do animals and plants compete – and what for?
-

- the importance of plant reproduction through insect pollination in human food security
- how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.

Working Scientifically








Plan	<ul style="list-style-type: none"> • plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	<ul style="list-style-type: none"> • take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Record	<ul style="list-style-type: none"> • record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Review	<ul style="list-style-type: none"> • use test results to make predictions to set up further comparative and fair tests • report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • identify scientific evidence that has been used to support or refute ideas or arguments

Enquiry Skills

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
	Classifying Liquourice Allsort into a classification key independently			



UKS2 – Year 6 – Term 2 - Electricity

UKS2 – Year 6 – Term 2 - Electricity										
National Curriculum Objective	Sticky Knowledge	Vocabulary								
<ul style="list-style-type: none">Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. <ul style="list-style-type: none">Use recognised symbols when representing a simple circuit in a diagram.	<ul style="list-style-type: none">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.’The greater the current flowing through a device the harder it works.Current is how much electricity is flowing round a circuit. <p>When current flows through wires heat is released. The greater the current, the more heat is released.</p> <div><div><p>Battery</p></div><div><p>Wire</p></div><div><p>Bulb</p></div><div><p>Buzzer</p></div><div><p>Motor</p></div><div><p>Switch (off)</p></div><div><p>Switch (on)</p></div></div>	<p>Electricity, neutrons, protons, electrons, nucleus, atom, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator, conductor.</p> <table><tr><th>Key Scientists</th><th>Linked Texts</th></tr><tr><td>Alessandro Volta (Electrical Battery)</td><td>Goodnight Mister Tom (Michelle Magorian)</td></tr><tr><td>Nicola Tesla (Alternating Currents)</td><td>Blackout (John Rocco)</td></tr><tr><td></td><td>Hitler’s Canary (Sandi Toksvig)</td></tr></table>	Key Scientists	Linked Texts	Alessandro Volta (Electrical Battery)	Goodnight Mister Tom (Michelle Magorian)	Nicola Tesla (Alternating Currents)	Blackout (John Rocco)		Hitler’s Canary (Sandi Toksvig)
Key Scientists	Linked Texts									
Alessandro Volta (Electrical Battery)	Goodnight Mister Tom (Michelle Magorian)									
Nicola Tesla (Alternating Currents)	Blackout (John Rocco)									
	Hitler’s Canary (Sandi Toksvig)									
Prior Learning	Key Question(s)	Future Learning								
<p>In Year 4, children should:</p> <ul style="list-style-type: none">Identify common appliances that run on electricity.Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.Identify whether a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop with a battery.Recognise that a switch opens and closes the circuit and associate this with whether a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.Know the difference between a conductor and an insulator, giving examples of each.Safety when using electricity.	<ul style="list-style-type: none">Do all batteries push as hard as each other?What is electricity?How does the voltage of a battery affect how much current is pushed?How does the length of time I leave the current flowing for affect the brightness of the bulb?How does number of bulbs affect the brightness of a bulb?Are all types of wires as good as conducting electricity?Why are wires insulated in plastic? Does type of material make a difference?Does length of wire make a difference?Does the type of circuit affect how the components work/long the battery lasts?What renewable ways can we generate electricity?How does current affect heat?What are the dangers of a short circuit?	<p>In Key Stage Three children will learn:</p> <ul style="list-style-type: none">Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of chargePotential difference measured in volts, battery and bulb ratings, resistance measured in ohms, as the ratio of potential difference (p.d.) to currentDifferences in resistance between conducting and insulating components (quantitative).Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects <p>The idea of electric field, forces acting across the space between objects not in contact.</p>								



Working Scientifically

Plan	<ul style="list-style-type: none"> plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	<ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
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Enquiry Skills

Observing over time	Identifying and classifying	Pattern seeking	Research	Comparative and fair testing
			Create own burglar alarm or air raid siren	








UKS2 – Year 6 – Term 3 – Evolution and Inheritance

UKS2 – Year 6 – Term 3 – Evolution and Inheritance				
National Curriculum Objective	Sticky Knowledge	Vocabulary		
<ul style="list-style-type: none">● Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents● Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.● Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago <p>Non-statutory</p> <ul style="list-style-type: none">● Know about evolution and can explain what it is.	<ul style="list-style-type: none">• Life cycles have evolved to help organisms survive to adulthood.• Over time the characteristics that are most suited to the environment become increasingly common.• Characteristics have changed to help organisms survive <p><i>NB: The following could be duplicated in Year 6 Living things and their habitats.</i></p> <ul style="list-style-type: none">• Organisms best suited to their environment are more likely to survive long enough to reproduce. Organisms are best adapted to reproduce are more likely to do so.• Organisms reproduce and offspring have similar characteristic patterns.• Variation exists within a population (and between offspring of some plants)• Competition exists for resources and mates <p>Note: at this stage, pupils are not expected to understand how genes and chromosomes work.</p>	Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Variation, Inherited, Environmental, Mutation, Competition, Survival of the Fittest, Evidence,		
		Key Scientists	Linked Texts	
		Charles Darwin and Alfred Russel Wallace (Theory of Evolution by Natural Selection)	<i>One Smart Fish</i> (Christopher Wormell)	
		Jane Goodall (Chimpanzees)	<i>The Molliebird</i> (Jules Pottle)	
			<i>Our Family Tree</i> (Lisa Westberg Peters)	
Prior Learning	Key Question(s)	Future Learning		
<p>From Key Stages 1 & 2, children should:</p> <ul style="list-style-type: none">• Understand there is a variety of life on Earth• Know that some animal's differences are important to their survival• Know how animals and plants reproduce• Know how fossils form over time <p>Year 1 – Study of significant figure – Marry Anning</p>	<ul style="list-style-type: none">• Why are we all different?• What is variation, and why is it important?• How did life begin on Earth?• How do we change?• What is evolution?• What evidence is there for evolution?• How does evolution happen?• What reasons do animals become extinct?• Polar Bears' habitat is rapidly changing, what possible futures do they face, and can we predict which is most likely?• How did Darwin come up with the theory?• Why was his theory not initially accepted?	<p>In Key Stage 3 children will learn about: ☐</p> <ul style="list-style-type: none">• heredity as the process by which genetic information is transmitted from one generation to the next• the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation• the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection• changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction• the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.		
Working Scientifically				



Plan	<ul style="list-style-type: none"> plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	<ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Record	<ul style="list-style-type: none"> record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Review	<ul style="list-style-type: none"> use test results to make predictions to set up further comparative and fair tests report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations identify scientific evidence that has been used to support or refute ideas or arguments

Enquiry Skills

Observing over time 	Identifying and classifying 	Pattern seeking 	Research 	Comparative and fair testing 
<p>Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time.</p> <p>They should be introduced to 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. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox.</p> <p>Working Scientifically - Observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs,</p>		<ul style="list-style-type: none"> Looking at different fossils Looking at other parts of nature under microscopes to see if their skeletons follow any pattern (leaves) 	<p>Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.</p> <ul style="list-style-type: none"> Mary Anning Charles Darwin's Theory of Evolution 	<p>Comparing different animals and their characteristics and how this compares to their habitat</p>



tendrils on climbing plants, brightly coloured and scented flowers				
Enrichment	Holdenhurst Sewage works visit (NOT 2023 due to closures and work) Wessex Water workshops – World Water Day			

UKS2 – Year 6 – Term 4 – Animals, including humans - (Circulatory system and Exercise)			
National Curriculum Objective	Sticky Knowledge	Vocabulary	
<ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. 	<ul style="list-style-type: none"> The heart pumps blood around the body. Oxygen is breathed into the lungs where it is absorbed by the blood. Muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.) 	Oxygenated, Deoxygenated, Valve, Exercise, Respiration Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.	
		Key Scientists	Linked Texts






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UKS2 – Year 6 – Term 5 - Light

National Curriculum Objective	Sticky Knowledge	Vocabulary	
<p>Recognise that light appears to travel in straight lines.</p> <p>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>Non-statutory:</p> <p>Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.</p>	<ul style="list-style-type: none"> Animals see light sources when light travels from the source into their eyes. Animals see objects when light is reflected off that object and enters their eyes. Light reflects off all objects (unless they are black). Non shiny surfaces scatter the light, so we do not see the beam. <p>Light travels in straight lines.</p>	<p>Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent. Reflect Absorb Emitted Scattered Refraction</p>	
		Key Scientists	Linked Texts
		<p>Thomas Young (Wave Theory of Light)</p> <p>Ibn al-Haytham (Alhazen)</p>	<p><i>Letters from the Lighthouse</i> (Emma Carroll)</p> <p><i>The Gruffalo's Child</i></p>







		(Light and our Eyes)	(Julia Donaldson)		
		Percy Shaw (The Cats Eye)	<i>The King Who Banned the Dark</i> (Emily Haworth-Booth)		
Prior Learning		Key Question(s)		Future Learning	
<p>In Year 3 children should:</p> <ul style="list-style-type: none">Recognise that they need light in order to see things and that dark is the absence of light.Notice that light is reflected from surfaces.Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.Recognise that shadows are formed when the light from a light source is blocked by a solid object. <p>Find patterns in the way that the sizes of shadows change.</p>		<ul style="list-style-type: none">How does the size of an object affect the size of a shadow?How does the distance between the light and the object change the size of a shadow?How does the distance between the object and the size of the screen affect the size of a shadow?How would a solar eclipse be different if: - The moon was a different size?<ul style="list-style-type: none">The earth span faster or slower?The sun was larger or smaller?If the earth and moon where the same size but further away in the solar system?How does the amount of aluminium foil scrunched affect how much light is scatters?How does the amount of polishing affect how well a piece of metal scatters light?How perfect are our mirrors? Do some scatter light more than others?What happens to light when it is shone through water? How is this affected by putting glitter, salt or talc in the water?How does a periscope/microscope/telescope work?		<p>In Key Stage 3, children will learn about:</p> <ul style="list-style-type: none">the similarities and differences between light waves and waves in matterlight waves travelling through a vacuum; speed of lightthe transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface Scienceuse of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative), the human eyelight transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras <p>colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.</p>	
Working Scientifically					
Plan	<ul style="list-style-type: none">plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary				
Do	<ul style="list-style-type: none">take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate				
Record	<ul style="list-style-type: none">record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs				
Review	<ul style="list-style-type: none">use test results to make predictions to set up further comparative and fair testsreport and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentationsidentify scientific evidence that has been used to support or refute ideas or arguments				
Enquiry Skills					
Observing over time		Identifying and classifying		Pattern seeking	
				Research	
				Making periscopes How to use mirrors and a torch to make light travel around the corner	Comparative and fair testing
					



UKS2 – Year 6 – Term 6 – Animals, including Humans - (Keeping Healthy, Diet & Lifestyle)

National Curriculum Objective	Sticky Knowledge	Vocabulary	
<p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Non –statutory:</p> <p>Learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.</p> <p>Build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function.</p> <p>●</p>	<p>The heart pumps blood around the body.</p> <p>Oxygen is breathed into the lungs where it is absorbed by the blood.</p> <p>Muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the</p> <p>blood through blood vessels to the muscles; the muscles take</p> <p>oxygen and nutrients from the blood.)</p>	<p>Oxygenated, Deoxygenated, Valve, Exercise, Respiration Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.</p>	
		<p>Key Scientists</p> <p>Justus von Liebig (Theories of Nutrition and Metabolism)</p> <p>Sir Richard Doll (Linking Smoking and Health Problems)</p> <p>Leonardo Da Vinci</p>	<p>Linked Texts</p> <p><i>Pig-Heart Boy</i> (Malorie Blackman)</p> <p><i>Skellig</i> (David Almond)</p> <p><i>A Heart Pumping Adventure</i> (Heather Manley)</p>



		(Anatomy)			
Prior Learning		Key Question(s)		Future Learning	
<p>In Year 4, children should:</p> <ul style="list-style-type: none">• Recognise that living things can be grouped in a variety of ways.• Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. <p>Recognise that environments can change and that this can sometimes pose danger to living things.</p>		<ul style="list-style-type: none">• Why do we need to classify living things?• How do we classify?• What are the difficulties with classification? (penguins, whales, platypus)• How do animals change over time?• Why does variation exist?• What happens if animals of different species breed? (hybrids)• What happens to house plants outside?• What are microorganisms?• How can we prevent the spread of disease?• Why do animals and plants compete – and what for?• 		<p>In Key Stage 3 children will learn about:</p> <ul style="list-style-type: none">• the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere• the adaptations of leaves for photosynthesis.• the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops• the importance of plant reproduction through insect pollination in human food security <p>how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.</p>	
Working Scientifically					
Plan	<ul style="list-style-type: none">• plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary				
Do	<ul style="list-style-type: none">• take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate				
Record	<ul style="list-style-type: none">• record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs				
Review	<ul style="list-style-type: none">• use test results to make predictions to set up further comparative and fair tests• report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations• identify scientific evidence that has been used to support or refute ideas or arguments				
Enquiry Skills					
Observing over time		Identifying and classifying		Pattern seeking	
				Research	
				Comparative and fair testing	