

# Science Overview

National Curriculum Coverage, Progression in Skills and Knowledge and Supporting Resources/Schemes of Work

## EYFS

	3 & 4-year-olds will be learning to:	Children in Reception will be learning to:	ELG
Understanding the World	<ul style="list-style-type: none"> <li>Use all their senses in hands-on exploration of natural materials.</li> <li>Explore collections of materials with similar and or/different properties.</li> <li>Explore how things work.</li> <li>Plants seeds and care for growing plants.</li> <li>Understand the key features of a life cycle of a plant and an animal.</li> <li>Begin to understand the need to respect and care for the natural environment and all living things.</li> </ul>	<ul style="list-style-type: none"> <li>Explore the natural world around them.</li> <li>Describe what they see, hear, smell and feel whilst outside.</li> <li>Recognise some similarities and differences between life in this country and life in other countries.</li> <li>Recognise some environments that are different to the one in which they live.</li> <li>Understand the effect of changing seasons on the natural world around them.</li> </ul>	<b>The Natural world</b> <ul style="list-style-type: none"> <li>Explore the natural world around them, making observations and drawing pictures of animals and plants.</li> <li>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.</li> <li>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</li> </ul>

## Year 1

Working Scientifically	<ul style="list-style-type: none"> <li>Ask simple questions and recognise that they can be answered in different ways</li> <li>Use simple equipment to observe closely</li> <li>Perform simple tests</li> <li>Identify and classify</li> <li>Use his/her observations and ideas to suggest answers to questions</li> <li>Gather and record data to help in answering questions</li> </ul>								
Theme	National Curriculum	Progression in Skills	Disciplinary Concepts	Key Questions	Key Facts	Key Vocab	Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
Autumn  Castles  Naming and identifying Materials	<p>Pupils should be taught to distinguish between an object and the material from which it is made.</p> <p>They will identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.</p> <p>They will describe the simple physical properties of a variety of everyday materials and compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>Materials</p> <p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Seasonal Changes</p>	<p><u>Asking Questions</u> Children will ask simple questions about different materials</p> <p><u>Setting up tests</u> Children will verbally state what they are going to investigate.</p> <p><u>Observing and Measuring</u> Children will observe closely the differences between materials</p>	<p>What are the properties of materials?</p> <p>How can we change the shape of materials?</p> <p>What changes can you see in Autumn and Winter?</p> <p>What happens to animals in Autumn and Winter?</p>	<p>Objects are made from materials such as wood, fabric, glass, metal, cardboard, plastic or clay.</p> <p>Some materials are magnetic.</p> <p>Autumn is one of the four seasons of the year</p> <p>The coldest temperatures of</p>	<p>Metal</p> <p>Attract</p> <p>Repel</p> <p>Wood</p> <p>Plastic</p> <p>Glass</p> <p>Fabric</p> <p>Magnetic</p> <p>Rough</p> <p>Smooth</p> <p>Bending</p> <p>Squashing</p> <p>Twisting</p> <p>Stretching</p> <p>Brittle</p> <p>Absorbent</p> <p>Waterproof</p>	<p>Skipton Castle</p> <p>Building castles using materials in the playground.</p> <p>Play out in snow.</p> <p>Gardening (outdoor learning)</p> <p>Create leaf monsters</p> <p>50 things: Jump in Muddy Puddles</p>		<p>The King who Banned the Dark</p> <p>Outstanding science</p> <p>Hamilton trust</p> <p>Science folder resources</p>

Seasonal Changes	<p>Seasonal Changes</p> <p>Pupils should be taught to observe changes across the four seasons and describe weather associated with the seasons and how day length varies.</p>	<p>Observe changes across the four seasons.</p> <p>Observe and describe weather associated with the seasons</p>	<p>Carry out simple tests using nonstandard measurements when appropriate.</p> <p><u>Recording</u> Children will gather and record simple data.</p> <p>Sort objects and living things into groups based on simple properties.</p> <p><u>Interpreting Results</u> Children will explain what they found out to an adult or a partner.</p>		the year are in winter.	Environment	<p>50 things: Collect pine cones</p> <p>50 things build a den</p>		
<b>Oracy opportunities for Autumn term</b>	End of topic discussion: Which material is the best to build a castle?								
<p><b>Spring</b></p> <p><b>Eco Warriors</b></p> <p>Animals including Humans</p> <p>Seasonal Changes</p>	<p>Pupils should be taught to identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>They will identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Pupils will describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</p> <p>They will identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>Animals Including Humans</p> <p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p> <p>Describe the basic needs of animals,</p>	<p><u>Asking Questions</u> Children will ask simple questions about the differences between a variety of common animals.</p> <p><u>Making Predictions</u> Children will predict and sort a variety of health and unhealthy foods</p> <p><u>Setting up tests</u> Children will</p> <p><u>Observing and Measuring</u> Children will observe the differences between plant life during the different seasons</p> <p><u>Recording</u> Children will record the changes photographically in seasonal change</p>	<p>What senses do humans have?</p> <p>How do humans change as they get older?</p> <p>What are the basic needs of humans?</p> <p>What do humans need to do to stay healthy?</p> <p>What happens to the environment in Spring?</p>	<p>The five senses are smell, touch, hear, feel and taste.</p> <p>Exercising is good for humans.</p> <p>Spring is the season when plants start to grow again.</p>	<p>Senses</p> <p>Amphibians</p> <p>Reptiles</p> <p>Mammals</p> <p>Carnivore</p> <p>Herbivore</p> <p>Omnivore</p> <p>Adults</p> <p>Air</p> <p>Hygiene</p>	<p>Healthy Nutrition</p> <p>STEM visit Careers/ Aspirations/science week</p> <p>Rethink food indoor garden</p> <p>Gardening (outdoor learning)</p> <p>Spring Walk</p>	<p>Age: Dear Earth- Grandad and granddaughter Grandad was an explorer.</p>	<p>Dear Earth by Isabel Otter</p> <p>Now Press Play</p> <p>Outstanding science Hamilton trust Science folder resources</p>

	Seasonal Changes  Pupils should be taught to identify changes across the four seasons and describe weather associated with the seasons and how day length varies.	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.  Seasonal Changes  Observe changes across the four seasons.  Observe and describe weather associated with the seasons and how day length varies		<b>Possible Misconceptions:</b> <b>Animals</b> 1. Misconception: All ocean creatures are 'fish', e.g. whales, dolphins. Fact: Whales, dolphins, jellyfish and shellfish are not fish, but seahorses and sea dragons are fish!				
<b>Oracy opportunities for spring term</b>		<b>Everyone's an expert:</b> How am I different from an elderly? (From the point of view of a child)						
<b>Summer</b>	Plants	Plants	<u>Asking Questions</u> Children will ask questions about the features and structures of a variety of common plants.  <u>Making Predictions</u> Children will make predictions of what will happen to plants placed in different areas such as windowsill or closed cupboard.  <u>Setting up tests</u> Children will verbally state what they are going to investigate  Children will design investigation for testing what will happen when plants are placed in different places.  <u>Observing and Measuring</u> Children will observe the differences between plant life	What are the common, wild and garden plants and trees?  What are the four seasons?  How does the weather change in these four seasons?  What are garden and wild plants?  What is a flower made up of?  What do plants need to grow?	The four seasons are Spring, Summer, Autumn and Winter.  Flowers are made up of roots, stems, leaves and flowers.  Plants need water, nutrients and sunlight to grow.  Summer usually is the hottest of the four seasons.	Wild Deciduous Evergreen	Now press play-seasonal changes.  Planting and growing plants in classroom and outdoors.  50 things: Roll down a grassy hill	Now Press Play-Habitats  Outstanding science Hamilton trust Science folder resources
<b>Incredible India</b>	Pupils should be taught to:  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, including trees.	Identify and describe the basic structure of a variety of common flowering plants, including trees.  Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.						
Seasonal Changes	Seasonal Changes  Pupils should be taught to observe changes across the four seasons and describe weather associated with the seasons and how day length varies.	Seasonal Changes  Observe changes across the four seasons.  Observe and describe weather associated with the seasons and how day length varies						
				<b>Possible Misconceptions:</b> <b>Plants</b> 1. Misconception: Trees are not plants. Fact: Trees are plants.  2. Misconception: Many flowering plants have been mistaken to be non-flowering plants due to inconspicuous flowers or infrequent flowering. Fact: Mosses and liverworts, ferns and conifers are non-flowering plants. Most other plants are flowering plants.				

			<p>during the different seasons</p> <p><u>Recording</u> Children will record the changes photographically in seasonal change</p> <p><u>Interpreting Results</u> Children will explain what they found out to an adult or a partner.</p>				
<b>Oracy opportunities for summer term</b>		Ignite speech on the chosen habitat					

## Year 2

<b>Working Scientifically</b>	<ul style="list-style-type: none"> <li>• Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum</li> <li>• Use simple equipment to observe closely including changes over time</li> <li>• Perform simple comparative tests</li> <li>• Identify, group and classify</li> <li>• Use his/her observations and ideas to suggest answers to questions noticing similarities, differences and patterns</li> <li>• Gather and record data to help in answering questions including from secondary sources of information</li> </ul>								
<b>Theme</b>	<b>National Curriculum</b>	<b>Progression in Skills</b>	<b>Disciplinary Concepts</b>	<b>Key Questions</b>	<b>Key Facts</b>	<b>Key Vocab</b>	<b>Drivers &amp; 50 things</b>	<b>British Values &amp; Protective Characteristics</b>	<b>Schemes/Resources/ Texts</b>
<b>Autumn</b>  <b>History of Flight</b>  Animals including humans	Pupils should be taught to:  To notice that animals, including humans, have offspring which grow into adults  To find out about and describe the basic needs of animals, including humans, for survival (water, food and air)  To describe the importance for humans of exercise, eating the	<u>Animals Including Humans</u>  Understand that animals, including humans, have offspring which grow into adults  Describe the basic needs of animals, including humans, for survival (water, food and air)  Describe the importance for humans of exercise, eating the	<u>Asking Questions</u> Children will ask simple questions and recognise that they can be answered in different ways  <u>Making Predictions</u> Children will make predictions about the basic needs for animals including humans  <u>Setting up tests</u> Children will set up a test to investigate	What do animals need to help them survive?  How do humans change as they get older?  What are the offspring of animals called?  What is a bulb?  What do plants need to survive?	Animals and human beings need food, water, air, and shelter to survive.  Humans can only survive without water for three days.	Bulb Survival Temperature Toddler Teenager Elderly Offspring	Cooking lessons  Autumn walk- What happens to plants in Autumn and why?  Planting out Autumn bulbs to create a Spring daffodil display Autumnal maths outside -making 2-digit number using acorns or concerns as ones and sticks as tens	Age  Pregnancy	Cherry Blossom and Paper Planes  Kites  Outstanding science Hamilton trust Science folder resources

Plants	<p>right amounts of different types of food, and hygiene</p> <p>Plants</p> <p>Pupils should be taught to:</p> <p>To observe and describe how seeds and bulbs grow into mature plants</p> <p>To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>right amounts of different types of food, and hygiene</p> <p><u>Plants</u></p> <p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>what happens to their heart rate when they exercise</p> <p><u>Observing and Measuring</u></p> <p>Children will use stop watches and stethoscope to listen to and time heart rate</p> <p>Children will observe and describe how seeds and bulbs grow and mature</p> <p><u>Recording</u></p> <p>Children will record the changes in their heart rate</p> <p><u>Interpreting Results</u></p> <p>Children will explain how their body changed during exercise.</p> <p><u>Evaluating</u></p> <p>Children will evaluate how they could have improved their test.</p>	<p><b>Possible Misconceptions:</b></p> <p><b>Plants</b></p> <p>1.Misconception: Minerals in the soil, water and carbon dioxide are food for plants. Fact: Plants make their own food. Minerals help in plant growth and health. Water and carbon dioxide are ingredients for photosynthesis.</p> <p>2.Misconception: Roots are organs for feeding. Fact: Roots absorb minerals and water for the plants. Minerals and water are not food for plants.</p> <p>3.Misconception: Leaves take in water; the main function of leaves is to capture rain, water or dew; water vapour moves into the leaf during photosynthesis. Fact: Roots take in water. The main function of leaves is to carry out photosynthesis.</p>	<p>50 things: Look after a pet</p> <p>50 things: Kick the Autumn leaves</p> <p>50 things: Grow some daffodils</p>				
<b>Oracy opportunities for Autumn Term</b>	<p><u>Just a minute:</u> Presenting one of the groups of animals (Amphibians, mammals, birds, reptiles)</p> <p>Each member of the group will have one minute to talk about a subject. They will have time to prepare, but will only have one minute to talk about it without saying um, er, repeating themselves or pausing to remember. You could add competition to the game by seeing who can get the fewest points.</p>								
<p><b>Spring</b></p> <p><b>My Country My City</b></p> <p>Materials</p> <p>Plants</p>	<p>Materials</p> <p>Pupils should be taught to 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> <p>They will find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>Plants</p>	<p>Materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p>	<p><u>Asking Questions</u></p> <p>Children will ask simple questions and recognise that they can be answered in different ways</p> <p><u>Making Predictions</u></p> <p>Children will make simple predictions as to what will happen to a solid material when squashing, bending, twisting and stretching.</p> <p><u>Setting up tests</u></p>	<p>What materials are strong?</p> <p>What materials are weak?</p> <p>How are bulbs different from seeds?</p>	<p>Seeds need to wait for conditions to be just right before they start to grow.</p> <p>Bulbs can sprout new growth.</p>	<p>Material Properties</p> <p>Sprout</p>	<p>Now Press Play-Materials</p> <p>Material hunt outside</p> <p>50 things: Build a snowman</p> <p>50 things: Have a snowball fight</p> <p>STEM visit Careers/ Aspirations/science week</p> <p>Planting and growing plants in</p>		<p>BBC Bitesize</p> <p>Outstanding science</p> <p>Hamilton trust</p> <p>Science folder resources</p>

	<p>Pupils should be taught to observe and describe how seeds and bulbs grow into mature plants.</p> <p>They should find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>Describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>Plants</p> <p>Observe and describe how seeds and bulbs grow into mature plant.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>Children will. Identify what they will change and keep the same.</p> <p><u>Observing and Measuring</u> Children will observe closely different materials using simple equipment such as magnifying glasses.</p> <p>Perform simple tests using standard units when appropriate.</p> <p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p><u>Recording</u> Children will gather and record data to help in answering questions.</p> <p>Identifying and classifying.</p> <p><u>Interpreting Results</u> Children will use their observations and ideas to suggest answers to questions.</p> <p><u>Evaluating</u> Children will talk about what they have found out and how they found it out.</p>	<p><b>Possible Misconceptions:</b></p> <p><b>Plants</b></p> <p>1.Misconception: Minerals in the soil, water and carbon dioxide are food for plants. Fact: Plants make their own food. Minerals help in plant growth and health. Water and carbon dioxide are ingredients for photosynthesis.</p> <p>2.Misconception: Roots are organs for feeding. Fact: Roots absorb minerals and water for the plants. Minerals and water are not food for plants.</p> <p>3.Misconception: Leaves take in water; the main function of leaves is to capture rain, water or dew; water vapour moves into the leaf during photosynthesis. Fact: Roots take in water. The main function of leaves is to carry out photosynthesis.</p> <p><b>Materials</b></p> <p>1. Misconception: Confusion about hardness and strength Fact: The differences between the common usage and the scientific definitions of the terms ‘hardness’ and ‘strength’ should be emphasised to pupils. In science, hardness refers to the ability of a material to withstand scratching and strength refers to the ability of a material to support a heavy load without breaking or tearing. Thus, a piece of chalk which is conventionally considered to be hard is not considered hard in the scientific sense. It can easily be scratched.</p>	classroom and outdoors.				
<b>Oracy opportunities for spring Term</b>	Which material is the best to build a stage and why?								
<b>Summer</b>	Living things and their Habitats	<u>Living things and their Habitats</u>	<u>Asking Questions</u>	What types of habitats are there?	A habitat must provide food, shelter, water and space.	Habitat Shelter Microhabitat Deforestation Food Chain Producers Consumer Respiration Excretion Reproduction	Seaside Trip Filey  Now Press Play Habitats-year 2  50 things: Walk in the sand barefoot  50 things: Paddle in the sea	Age: David Attenborough (our environment linked to habitats)	Outstanding science Hamilton trust Science folder resources  BBC Bitesize
<b>The Great British Seaside</b>	<p>Pupils should be taught to explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>They will identify that most living things live in habitats to which they are suited and describe how</p>	<p>Explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>Identify that most living things live in habitats to which they are suited</p>	<p>Children will ask simple questions and recognise that they can be answered in different ways</p> <p><u>Making Predictions</u> Children will make simple predictions based on a question</p>	<p>How do animals adapt to certain habitats?</p> <p>How do animals depend on each other?</p>	<p>Different animals will require different things from their habitat.</p>				



Plants	<p>different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.</p> <p>Pupils will identify and name a variety of plants and animals in their habitats, including microhabitats.</p> <p>They will describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p> <p>Plants</p> <p>Pupils should be taught to identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>They will identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>Pupils should be taught to observe and describe how seeds and bulbs grow into mature plants. They will find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food</p> <p><u>Plants</u></p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p><u>Setting up tests</u> Children will. Identify what they will change and keep the same.</p> <p><u>Observing and Measuring</u> Children will observe closely, using simple equipment such as magnifying glasses.</p> <p>Perform simple tests using standard units when appropriate.</p> <p>observe and describe how seeds and bulbs grow into mature plants.</p> <p><u>Recording</u> Children will gather and record data to help in answering questions.</p> <p>Identifying and classifying animals by their habitats and physical features</p> <p><u>Interpreting Results</u> Children will use their observations and ideas to suggest answers to questions.</p> <p><u>Evaluating</u> Children will talk about what they have found out and how they found it out.</p>	<p>How do habitats provide what is needed for animals?</p> <p>What is a food chain?</p> <p>What is a food source?</p> <p>How do plants obtain the food?</p> <p>How do habitats change?</p>	<p>Habitats can change in many ways.</p> <p>A food chain shows how animals depend on plants and other animals for their food and survival.</p> <p>A food chain can tell you about what animals eat.</p>	<p><b>Possible Misconceptions:</b></p> <p><b>Plants</b></p> <p>1.Misconception: Minerals in the soil, water and carbon dioxide are food for plants. Fact: Plants make their own food. Minerals help in plant growth and health. Water and carbon dioxide are ingredients for photosynthesis.</p> <p>2.Misconception: Roots are organs for feeding. Fact: Roots absorb minerals and water for the plants. Minerals and water are not food for plants.</p> <p>3.Misconception: Leaves take in water; the main function of leaves is to capture rain, water or dew; water vapour moves into the leaf during photosynthesis. Fact: Roots take in water. The main function of leaves is to carry out photosynthesis.</p>	<p>Sum 2: Re Think food Hydroponics</p> <p>Planting and growing plants in classroom and outdoors.</p>		
Oracy opportunities for summer Term		Discussion: How do people change habitats?							

# Year 3

Working Scientifically									
<ul style="list-style-type: none"> <li>• Ask relevant questions and use different types of scientific enquiries to answer them</li> <li>• Set up simple practical enquiries, comparative and fair tests</li> <li>• Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>• Gather, record, classify and present data in a variety of ways to help in answering questions</li> <li>• Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>• Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>• Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>• Identify differences, similarities or changes related to simple scientific ideas and processes</li> <li>• Use straightforward scientific evidence to answer questions or to support his/her findings</li> </ul>									
Theme	National Curriculum	Progression in Skills	Disciplinary Concepts	Key Questions	Key Facts	Key Vocab	Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
Autumn	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	Plants	<u>Asking Questions</u> Children will ask questions and understand there are different enquiry types they could use to answer them.	What parts of the plant can we eat?  Does the amount of water affect the growth of the plant?  What are the three types of rock?  How are fossils formed?	The three types of rock are: - sedimentary - igneous - metamorphic  Fossils are the remains of traces of plants and animals that lived long ago.	Photosynthesis Trunk Nutrients Metamorphic Sedimentary Igneous Fossils Permeable Durable Density Molten	Aut 2 RE Think food indoor garden project  Planting and growing plants in classroom and outdoors.		Outstanding science Hamilton trust Science folder resources  Meadow Song
Who First Lived in Britain?	Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers  Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant	<u>Making Predictions</u> Children will make relevant predictions about the characteristics of various types of rocks.						
Plants	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	Investigate the way in which water is transported within plants	<u>Setting up tests</u> Children will identify what they will change, observe and keep the same.  With support, set up simple practical enquiries.						
Rocks	Describe in simple terms how fossils are formed when things that have lived are trapped within rock	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	<u>Observing and Measuring</u> Children will investigate the way in which water is transported within plants						
	Recognise that soils are made from rocks and organic matter	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed	Begin to use scientific equipment to make observations.						
				<b>Possible Misconceptions:</b>  <b>Plants</b> 1. Misconception: Plants carry out photosynthesis in the day and respiration at night. Fact: Plants carry out respiration all the time and photosynthesis when there is light.  2. Misconception: Plants breathe in carbon dioxide and breathe out oxygen. Fact: Plants take in carbon dioxide in the day when photosynthesis takes place and gives out oxygen at night or in the dark when photosynthesis stops, as respiration continues to take place.  3. Misconception: Respiration in plants occurs only in the cells of leaves, since only leaves have gas exchange pores. Fact: Respiration takes place in all plant cells.  4. Misconception: Plants do not respire, or they only respire in the dark. Fact: Plants respire all the time.					
							Aspirations – Mary Anning  Cliffe Castle Visit  Now Press Play  Planting and growing plants in classroom and outdoors.	Mary Anning – sex & age	Stone Girl, Bone Girl  Hamilton Trust



		<p>when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter</p>	<p>Carry out tests and simple experiments and take measurements using standard units.</p> <p><u>Recording</u> Children will gather and record data in different ways to help answer questions.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables</p> <p><u>Interpreting Results</u> Children will report on findings from enquiries, including oral and written explanations.</p> <p>Make simple conclusions.</p> <p>Use results, findings or observations to answer questions.</p> <p><u>Evaluating</u> Children will suggest questions for further investigation.</p>				
<p><b>Oracy opportunities for Autumn term</b></p>	<p><b>Ignite speech: What are the uses of rocks?</b></p>						

<p><b>Spring</b></p> <p><b>Here, There and Everywhere</b></p>	<p>identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</p>	<p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</p>	<p><u>Asking Questions</u> Children will ask questions and understand there are different enquiry types they could use to answer them.</p>	<p>What is diet and nutrition?</p> <p>Do all animals have a skeleton?</p>	<p>Animals can be grouped according to their bone structure.</p> <p>Animals can be grouped according to what they eat.</p>	<p>Muscle Skeleton Lungs Diaphragm Biceps Triceps Diet Nutrition Vertebrate Invertebrate</p>	<p>Healthy Lifestyles</p> <p>50 things – plan and cook a meal</p> <p>STEM visit Careers/ Aspirations/science week</p>		<p>Outstanding science Hamilton trust Science folder resources</p>
<p><b>Animals including humans</b></p>	<p>identify that humans and some other animals have skeletons and muscles for support, protection and movement</p>	<p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p>	<p><u>Making Predictions</u> Children will make relevant predictions.</p>	<p>How do muscles work?</p> <p>How is water transported through plants?</p>	<p>Some seeds are transported by wind, and have seeds designed to float, glide or spin through the air.</p>	<p>Xylem Transportation Pollination Seed dispersal</p>	<p>Plan and grow flowers outside</p>		<p>Outstanding science Hamilton trust Science folder resources</p>
<p><b>Plants</b></p>	<p>explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p>	<p><u>Setting up tests</u> Children will identify what they will change, observe and keep the same.</p>	<p>What are the ways plants disperse their seeds?</p>	<p>Plants growing near a river may use the flowing water to transport their seeds.</p>				<p>Meadow Song</p>
	<p>investigate the way in which water is transported within plants</p> <p>explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>	<p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>	<p>With support, set up simple practical enquiries</p>		<p>Sometimes animals can move seeds.</p>				
			<p><u>Observing and Measuring</u></p>	<p><b>Possible Misconceptions:</b> <b>Plants</b> 1. Misconception: Plants carry out photosynthesis in the day and respiration at night. Fact: Plants carry out respiration all the time and photosynthesis when there is light. 2. Misconception: Plants breathe in carbon dioxide and breathe out oxygen. Fact: Plants take in carbon dioxide in the day when photosynthesis takes place and gives out oxygen at night or in the dark when photosynthesis stops, as respiration continues to take place. 3. Misconception: Respiration in plants occurs only in the cells of leaves, since only leaves have gas exchange pores. Fact: Respiration takes place in all plant cells. 4. Misconception: Plants do not respire, or they only respire in the dark. Fact: Plants respire all the time.</p>					
			<p>Children will investigate the way in which water is transported within plants</p>	<p>Begin to use scientific equipment to make observations.</p>					
			<p>Carry out tests and simple experiments and take measurements using standard units.</p>	<p><u>Recording</u> Children will gather and record data in different ways to help answer questions.</p>					
			<p>Recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables</p> <p><u>Interpreting Results</u> Children will report on findings from enquiries, including</p>						

			<p>oral and written explanations.</p> <p>Make simple conclusions.</p> <p>Use results, findings or observations to answer questions.</p> <p><u>Evaluating</u> Children will suggest questions for further investigation.</p>						
<b>Oracy opportunities for spring term</b>		<b>Discussion: Consider life without plants</b>							
<b>Summer Forces and Magnets</b>	<p>compare how things move on different surfaces</p> <p>notice that some forces need contact between 2 objects, but magnetic forces can act at a distance</p> <p>observe how magnets attract or repel each other and attract some materials and not others</p> <p>compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials</p> <p>describe magnets as having 2 poles</p> <p>predict whether 2 magnets will</p>	<p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>Compare and group together a variety of everyday materials</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that</p>	<p><u>Asking Questions</u> Children will ask questions and understand there are different enquiry types they could use to answer them.</p> <p><u>Making Predictions</u> Children will make relevant predictions based on their scientific understanding as to whether a material is magnetic or not.</p> <p><u>Setting up tests</u> Children will identify what they will change, observe and keep the</p>	<p>What is a force?</p> <p>Do things move differently on different surfaces?</p> <p>What materials are magnetic?</p> <p>Which magnetic poles attract and which repel?</p> <p>What is light?</p> <p>Which materials reflect light?</p>	<p>Forces are the things that allow the movement of all objects around us.</p> <p>Magnets have two poles; north and south.</p> <p>Light is a form of energy that enables us to see the world around us.</p> <p>Light comes from different sources.</p> <p>Our main source of natural light is the Sun.</p>	<p>Force Newtons Shadows Reflect Transparent Translucent Opaque</p>	<p>Planting and growing plants in classroom and outdoors.</p> <p>50 things - Shadow puppets</p>	<p>Outstanding science Hamilton trust Science folder resources</p>	

<p><b>Light</b></p>	<p>attract or repel each other, depending on which poles are facing</p> <p>recognise that they need light in order to see things and that dark is the absence of light</p> <p>notice that light is reflected from surfaces</p> <p>recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>find patterns in the way that the size of shadows change</p>	<p>there are ways to protect eyes</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect eyes</p> <p>Find patterns in the way that the size of shadows change</p>	<p>same. Whilst testing different materials</p> <p>With support, set up simple practical enquiries.</p> <p><u>Observing and Measuring</u> Begin to use scientific equipment to make observations.</p> <p>Carry out tests and simple experiments and take measurements using standard units.</p> <p><u>Recording</u> Children will gather and record data in different ways to help answer questions.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables</p> <p><u>Interpreting Results</u> Children will report on findings from enquiries, including oral and written explanations.</p> <p>Make simple conclusions.</p> <p>Use results, findings or observations to answer questions.</p> <p><u>Evaluating</u> Children will suggest questions for further investigation.</p>	<p><b>Possible Misconceptions:</b></p> <p><b>Light</b></p> <p>1.misconception sight is purely an active human process 'I am looking at something, which is why I can see it' or that eyes give out a form of light to enable us to see</p> <p>2.misconception reflective surfaces emit light</p> <p>3.misconception only shiny surfaces or water reflect light</p> <p>4.misconception. opaque objects do not reflect light</p> <p>5.misconception opaque surfaces give out colour or 'darkness'</p> <p><b>Magnets and Forces</b></p> <p>Misconceptions 1 A stationary object has no forces acting on it. The reason the object is stationary is because the forces acting on it are balanced.</p> <p>Misconceptions 2 Mass and weight are the same thing. Mass is a measure of the amount of matter in an object; weight is a measure of the force exerted by the object due to gravity.</p> <p>Misconceptions 3. All metals are magnetic</p>			<p>Outstanding science Hamilton trust Science folder resources</p>
<p><b>Oracy opportunities for summer term</b></p>		<p><b>Discussion: Imagine you had magnets for fingers, would it be good?</b></p>					

# Year 4

Working Scientifically									
<ul style="list-style-type: none"> <li>• Ask relevant questions and use different types of scientific enquiries to answer them</li> <li>• Set up simple practical enquiries, comparative and fair tests</li> <li>• Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>• Gather, record, classify and present data in a variety of ways to help in answering questions</li> <li>• Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>• Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>• Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>• Identify differences, similarities or changes related to simple scientific ideas and processes</li> <li>• Use straightforward scientific evidence to answer questions or to support his/her findings</li> </ul>									
Theme	National Curriculum	Progression in Skills	Disciplinary Concepts	Key Questions	Key Facts	Key Vocab	Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
<b>Autumn</b> <b>Our Magical City</b> <b>States of Matter</b>	<p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</p> <p>Identify differences, similarities or changes related to simple scientific ideas and processes</p> <p>Use straightforward scientific evidence to answer questions or to support his/her findings</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<p><u>Asking Questions</u> Children will ask relevant questions and use different types of scientific enquiry to answer them.</p> <p><u>Making Predictions</u> Children will make predictions based on simple scientific knowledge</p> <p><u>Setting up tests</u> Children will identify what they will change, observe or measure and keep the same.</p> <p>Set up simple practical enquiries, comparative and fair tests.</p> <p><u>Observing and Measuring</u> Children will make systematic and careful observations.</p> <p>Take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p><u>Recording</u> Children will gather, record and classify</p>	<p>What are the different states of matter?</p> <p>How does a material change from one state to another?</p> <p>How are clouds in the sky formed?</p> <p>What temperature does water evaporate?</p>	<p>Matter is another word for the stuff things are made of.</p> <p>Everything falls into one of three categories; solid, liquid or gas.</p> <p>Materials can change from one state of matter to another through freezing and melting.</p> <p>The water cycle converts water into all three different states; liquid, solid (ice) and gas (vapour).</p> <p>Clouds are formed after water from the earth is evaporated by the sun.</p> <p>Vapour that has turned into liquid can be released by clouds in the form of rain or snow.</p>	<p>States of Matter Solid Liquid Gas Reversible Irreversible Precipitation Evaporation Condensation Filtering</p>	<p>Outdoor learning – physically making solids, liquids and gases</p> <p>Planting and growing plants in classroom and outdoors.</p> <p>50 things: Play conkers</p>		<p>Outstanding science Hamilton trust Science folder resources</p> <p>The Rhythm of the Rain</p> <p>Yorkshire Water</p>



			<p>data in a variety of ways to help in answering questions.</p> <p>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p><u>Interpreting Results</u> Children will Use straightforward scientific evidence to answer questions or to support their findings.</p> <p>Use results to draw simple conclusions.</p> <p>Begin to identify differences, similarities or changes related to simple ideas or processes.</p> <p><u>Evaluating</u> Children will begin to make predictions for new values, suggest improvements and raise further questions.</p>	<p><b>Possible Misconceptions:</b>  <b>Changes in matter</b>  <b>Misconceptions 1</b> Liquids that evaporate/boil disappear forever.  <b>Misconceptions 2</b> fizzy-drinks can or glass container becomes wet because liquid from the inside seeps through to the outside.  <b>Misconceptions 3.</b> When a substance has dissolved it has 'disappeared'.  <b>Misconceptions 4</b> Substances (like sugar) 'melt' in water.</p>				
<b>Oracy opportunities for Autumn Term</b>		Debate: Solid, liquid, Gas – which one is most important?						
<b>Spring</b>  <b>17<sup>th</sup> Century Britain</b>  <b>Electricity</b>	<p>identify common appliances that run on electricity</p> <p>construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</p> <p>recognise that a switch opens and closes a circuit and associate</p>	<p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</p> <p>Recognise that a switch opens and closes a circuit and associate this</p>	<p><u>Asking Questions</u> Children will ask relevant questions and use different types of scientific enquiry to answer them.</p> <p><u>Making Predictions</u> Children will make predictions based on simple scientific knowledge</p> <p><u>Setting up tests</u> Children will identify what they will change, observe or measure and keep the same.</p>	<p>What are the key components of a circuit?</p> <p>Which materials conduct electricity?</p> <p>Does the number of batteries affect the brightness of a bulb?</p>	<p>Electricity is an energy. This energy can be used to power electrical items.</p> <p>Electricity can only travel if there is a complete circuit.</p> <p>A complete circuit is made up of different components - batteries (or cell), wires and bulbs, buzzers and motors.</p>	<p>Circuit Cell Crocodile clip Switch Bulb Conductor Insulator Component Classification Characteristic Organism Amphibians</p>	<p>STEM visit Careers/ Aspirations/science week</p> <p>Planting and growing plants in classroom and outdoors.</p> <p>50 things: Explore a cave (Oakworth cave trip)</p>	<p>Outstanding science Hamilton trust Science folder resources</p> <p>Lux app</p>

<p><b>Living things and their habitats</b></p>	<p>this with whether or not a lamp lights in a simple series circuit</p> <p>recognise some common conductors and insulators, and associate metals with being good conductors</p> <p>recognise that living things can be grouped in a variety of ways</p> <p>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>recognise that environments can change and that this can sometimes pose dangers to living things</p>	<p>with whether or not a lamp lights in a simple series circuit</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors</p> <p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p>	<p>Set up simple practical enquiries, comparative and fair tests.</p> <p><u>Observing and Measuring</u> Children will make systematic and careful observations.</p> <p>Take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p><u>Recording</u> Children will gather, record and classify data in a variety of ways to help in answering questions.</p> <p>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p><u>Interpreting Results</u> Children will Use straightforward scientific evidence to answer questions or to support their findings.</p> <p>Use results to draw simple conclusions.</p> <p>Begin to identify differences, similarities or changes related to simple ideas or processes.</p> <p><u>Evaluating</u> Children will begin to make predictions for new values, suggest improvements and raise further questions.</p>	<p>How can we group different living things?</p> <p>What is a classification key?</p>	<p>An organism is an individual animal, plant, or single-celled life form.</p> <p>A classification key is a series of questions that determine an organism's physical characteristics to help identify an unknown organism.</p>				<p>Outstanding science Hamilton trust Science folder resources</p> <p>Seek app by iNaturalist</p>
<p><b>Possible Misconceptions:</b>  <b>Electricity</b>  <b>Misconceptions 1 Different coloured wires affect how the circuit works.</b>  <b>Misconceptions 2 Wire is made of plastic.</b>  <b>Misconceptions 3 If a circuit is broken, energy goes off into the air.</b>  <b>Misconceptions 4 Electricity comes out of both sides of the battery and leads to both sides of the component.</b>  <b>Misconceptions 4 Current, voltage and electricity are all the same thing.</b>  <b>Misconceptions 5 Current gets less as it passes through components.</b>  <b>Misconceptions 6 Electricity is an object that can be seen.</b></p>									



			<p>Use straightforward scientific evidence to answer questions or to support their findings.</p> <p>Use results to draw simple conclusions.</p> <p>Begin to identify differences, similarities or changes related to simple ideas or processes.</p> <p><u>Evaluating</u> Children will begin to make predictions for new values, suggest improvements and raise further questions.</p>					
Oracy opportunities for summer Term		Debate: The tongue is more important than teeth						

## Year 5

Working Scientifically	<p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <ul style="list-style-type: none"> <li>• Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line</li> <li>• Use test results to make predictions to set up further comparative and fair tests</li> <li>• 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</li> <li>• Identify scientific evidence that has been used to support or refute ideas or arguments</li> </ul>								
Theme	National Curriculum	Progression in Skills	Disciplinary Concepts	Key Questions	Key Facts	Key Vocab	Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
<b>Autumn</b>  <b>Adventures</b>  Earth and Space	<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>Describe the Sun, Earth, and Moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>	<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>Describe the movement of the Moon relative to the Earth</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night</p>	<p><u>Asking Questions</u> Children will ask scientific questions and begin to understand which questions would be best suited to each enquiry type.</p> <p><u>Making Predictions</u> Children will make predictions based on scientific knowledge.</p> <p><u>Setting up tests</u> Children will with support, plan</p>	<p>How do we know the Sun, Moon and Earth are spherical?</p> <p>What is the name of the planets in our solar system, in order?</p> <p>What is the difference between heliocentric and geocentric ideas of planetary movement?</p> <p>How do night and day occur?</p> <p>Why does night time and day time occur at</p>	<p>A day is how long it takes a planet to rotate fully.</p> <p>A year is how long it takes a planet to orbit the Sun.</p> <p>The Moon has a diameter of 2,159 miles (3,476 kilometres) and is about one-quarter the size of Earth.</p> <p>The Moon weighs about 80 times less than Earth.</p>	Solar system Orbit Planet Mercury Venus Mars Jupiter Saturn Uranus Neptune Pluto Rotate Axis	<p>Outdoor/active learning – rotation of planets and moon in relation to the sun.</p> <p>ReThink Food indoor garden life on Mars Project</p> <p>Planting and growing plants in classroom and outdoors.</p>	<p>Sex: The women involved in getting man to the moon in the USA (Hidden Figures)</p>	<p><u>Earth and Space</u> The Mysteries of the Universe by Will Garter</p> <p>Now press play – Mission to Mars</p> <p>Outstanding science Hamilton trust Science folder resources</p> <p>Hidden Figures</p>

		and the apparent movement of the sun across the sky	<p>different types of scientific enquiry. Where appropriate, identify the dependent, independent and controlled variables.</p> <p><u>Observing and Measuring</u> Children will use a range of scientific equipment to make systematic and careful observations.</p> <p><u>Recording</u> Gather, record and classify data with increasing complexity to help in answering questions.</p> <p><u>Interpreting results</u> Children will use scientific evidence to answer questions.</p> <p>Make conclusions based on scientific evidence and from their own testing and findings.</p> <p><u>Evaluating</u> Children will make predictions for new values, suggest improvements and raise further questions.</p>	<p>different times around the world?</p> <p>How does the moon move in relation to earth?</p> <p>How does the earth move in relation to the sun?</p>	Saturn is the lightest planet.					
				<p><b>Possible Misconceptions:</b></p> <p><b>Earth and Space</b></p> <p><b>Misconception 1</b> The sun travels across the sky, this can lead the children to thinking the Sun orbits the earth.</p> <p><b>Misconceptions 2</b> it is dark at night because the sun is blocked. It is dark at night because we are turned away from the Sun.</p> <p><b>Misconception 3</b>, Earth is the biggest object within our Solar System because the Sun, Moon and other planets appear to be small from Earth. This is because we are looking at them from a distance. Many children are also surprised to learn that the Sun is a star. They may also believe that Mars is a hot planet because of its colour.</p> <p><b>Misconceptions 4</b>, Stars are only present in the sky during the night because that is when they can be seen. In the daytime, even on a dull day, the brightness of the Sun will stop all of the other stars in the sky from being seen.</p>						
<b>Oracy opportunities for Autumn term</b>		Debate – is there life on other planets?								
<b>Spring Beautiful Britain Forces</b>	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	<u>Asking Questions</u> Children will ask scientific questions and begin to understand which questions would be best suited to each	What is the effect of gravity on unsupported objects?  How does air resistance affect moving objects?	Gravity keeps the Earth and all the planets in our solar system in orbit around the Sun.	Gravity Air resistance Water resistance Buoyancy Friction Lever Gear	STEM visit Careers/ Aspirations/science week  Planting and growing plants in		Outstanding science  Hamilton trust	



<p>Animals Including Humans</p>	<p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p> <p><u>Animals Including Humans</u> Describe the changes as humans develop to old age.</p>	<p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</p> <p><u>Animals Including Humans</u> Describe the changes as humans develop to old age</p>	<p>enquiry type.</p> <p><u>Making Predictions</u> Children will make predictions based on scientific knowledge.</p> <p><u>Setting up tests</u> Children will with support, plan different types of scientific enquiry. Where appropriate, identify the dependent, independent and controlled variables.</p> <p><u>Observing and Measuring</u> Children will use a range of scientific equipment to make systematic and careful observations.</p> <p><u>Recording</u> Gather, record and classify data with increasing complexity to help in answering questions.</p> <p><u>Interpreting results</u> Identify differences, similarities or changes related to simple ideas or processes. evidence to answer questions.</p> <p>Make conclusions based on scientific evidence and from their own testing and findings.</p> <p><u>Evaluating</u> Children will make predictions for new values, suggest improvements and raise further questions.</p>	<p>How can you minimise the effect of water resistance on objects?</p> <p>What is the purpose of a lever?</p> <p><u>Animals Including Humans</u> What are the 6 different stages of human development, in order?</p> <p>What are the main changes that occur during puberty?</p> <p>What are the main changes that take place during old age?</p>	<p>A ship floats on water because the force from the water pushing it up is equal to the force pulling it down.</p> <p>Forces are measured in newtons (N) using a newton meter, named after Sir Isaac Newton.</p> <p><u>Animals Including Humans</u> Human beings always grow more brain cells than they need. This enables mental development in old age to continue.</p> <p>Some animals go through metamorphosis where they change into a very different animal.</p>	<p>Cog Pulley Puberty Foetus Fertilisation Adolescence</p>	<p>classroom and outdoors.</p> <p>Spring 2 – Rethink Food</p> <p>50 things: Make snow angels</p> <p>50 things: Take a walk through a forest</p>		
<p><b>Possible Misconceptions:</b></p> <p><b>Forces</b>  <b>Misconceptions 1</b> A stationary object has no forces acting on it. The reason the object is stationary is because the forces acting on it are balanced.  <b>Misconceptions 2.</b> The best place to put the fulcrum is in the centre of the lever. The mechanism will in fact have a bigger effect when it is closer to the object being moved.  <b>Misconceptions 3</b> A greater force on a mechanism always has a greater effect on the object. In fact, a mechanism can allow a smaller force to have a greater effect.  <b>Misconceptions 4</b> Mass and weight are the same thing. Mass is a measure of the amount of matter in an object; weight is a measure of the force exerted by the object due to gravity. It is important to define these measurements and the difference must be clear when introducing pulleys.</p>									

Oracy opportunities for spring term									
<p><b>Summer</b></p> <p><b>The Industrial Revolution</b></p> <p>Properties and changes of materials</p> <p>Living things and habitats</p>	<p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Recognise that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>Use knowledge of solids, liquids, and gases to decide how to group them.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect, and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p>	<p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p> <p>Recognise that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda</p>	<p><u>Asking Questions</u> Children will ask scientific questions and begin to understand which questions would be best suited to each enquiry type.</p> <p><u>Making Predictions</u> Children will make predictions based on scientific knowledge.</p> <p><u>Setting up tests</u> Children will with support, plan different types of scientific enquiry. Where appropriate, identify the dependent, independent and controlled variables.</p> <p><u>Observing and Measuring</u> Children will use a range of scientific equipment to make systematic and careful observations.</p> <p><u>Recording</u> Children will take accurate measurements using a range of scientific equipment.</p> <p>Start to take repeat readings when appropriate.</p> <p>Gather, record and classify data with increasing complexity to help</p>	<p>What are thermal conductors and insulators and why are they used?</p> <p>Which electrical conductors makes a bulb shine the brightest?</p> <p>What is the difference between melting and dissolving?</p> <p>What is the difference between sexual and asexual reproduction?</p> <p>What are the three different types of mammals?</p>	<p>The most common example of filtering is making a cup of tea.</p> <p>The material with the highest known melting temperature is a metal called tungsten which melts at 3387 degrees Celsius.</p> <p>Burning is an irreversible chemical change.</p> <p>The ostrich lays the biggest eggs of any land animal.</p> <p>A small number of animals are asexual which means they can self-fertilise.</p> <p>Elephants have the longest gestation period of all mammals, carrying their babies for almost two years (22 months).</p>	<p>Dissolve Insoluble Chemical Solution Permeable Soluble Resistance Filter Sieve a device Gestation period Asexual Cell Embryo</p>	<p>Planting and growing plants in classroom and outdoors.</p>		<p>Outstanding science Hamilton trust Science folder resources</p>
				<p><b>Possible Misconceptions:</b></p> <p>Changes in matter</p> <p>Misconceptions 1 Liquids that evaporate/boil disappear forever.</p> <p>Misconceptions 2 fizzy-drinks can or glass container becomes wet because liquid from the inside seeps through to the outside.</p> <p>Misconceptions 3. When a substance has dissolved it has 'disappeared'.</p> <p>Misconceptions 4 Substances (like sugar) 'melt' in water.</p>					

		<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p>	<p>in answering questions.</p> <p><u>Interpreting results</u> Children will use scientific evidence to answer questions.</p> <p>Make conclusions based on scientific evidence and from their own testing and findings.</p> <p>Identify differences, similarities or changes related to simple ideas or processes. evidence to answer questions.</p> <p>Make conclusions based on scientific evidence and from their own testing and findings.</p> <p>Identify differences, similarities or changes related to simple ideas or processes.</p> <p><u>Evaluating</u> Children will make predictions for new values, suggest improvements and raise further questions.</p>				
<p><b>Oracy opportunities for summer term</b></p>		<p>Debate: the heart is the most important organ in the body.</p>					

<b>Year 6</b> <b>Working Scientifically</b> <ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer their own or others' questions, including recognising and controlling variables where necessary</li> <li>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>Use test results to make predictions to set up further comparative and fair tests</li> <li>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</li> <li>Describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources</li> <li>Group and classify things and recognise patterns</li> </ul>									
Theme	National Curriculum	Progression in Skills	Disciplinary Concepts	Key Questions	Key Facts	Key Vocab	Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
<b>Autumn</b>  <b>Light</b>  <b>Animals Including Humans</b>	<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>Pupils should be taught to:</p> <p>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>describe the ways in which nutrients and water are transported within animals, including humans</p>	<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>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported</p>	<p><u>Asking Questions</u> Children will ask relevant scientific questions and choose which enquiry type would be best suited to answer them.</p> <p><u>Making Predictions</u> Children will make predictions based on scientific knowledge.</p> <p><u>Setting up tests</u> Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p><u>Observing and Measuring</u> Children will use a range of scientific equipment to make systematic and careful observations with increased complexity.</p> <p><u>Recording</u> Children will record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p>	<p>How does light travel?</p> <p>How do we see things?</p> <p>What do mirrors do to light?</p> <p>How do we see colours?</p> <p>Why do shadows have the same shape as the object that casts them?</p> <p>What is the circulatory system?</p> <p>How does diet effect growth?</p> <p>Are all drugs bad for you?</p> <p>How is water used within the body?</p> <p>What is blood made of?</p> <p>What are the main organs within the human body?</p> <p>What are the main systems of the human body?</p>	<p>Light travels slower through different materials like water and glass.</p> <p>We see different colours because each colour has its own wavelength.</p> <p>InfraRed rays are invisible to humans.</p> <p>Light travels nearly 900,000 times faster than sound.</p> <p>A prism splits a beam of light into the colours of the visible spectrum.</p> <p>The heart beats 2.5 billion times during the life of a 75-year-old.</p> <p>Blood is a mixture of fluid, plasma, white and red blood cells.</p> <p>Red blood cells transport oxygen to every cell and remove carbon dioxide.</p>	<p>Absorb</p> <p>Refract</p> <p>Prism</p> <p>Lens</p> <p>Ray</p> <p>Beam</p> <p>Focal point</p> <p>Blood vessel</p> <p>Circulatory system</p> <p>Plasma</p> <p>Platelets</p>	<p>Optician visit</p> <p>Planting and growing plants in classroom and outdoors.</p> <p>Cooking Lessons</p> <p>Healthy Nutrition</p> <p>Planting and growing plants in classroom and outdoors.</p>		<p>Outstanding science</p> <p>Hamilton trust</p>

		<p>within animals, including humans</p>	<p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p><u>Interpreting Results</u> Children will use scientific evidence to answer questions</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p><u>Evaluating</u> Children will use test results to make predictions to set up further comparative and fair tests.</p> <p>Suggest investigation improvements including accuracy of results.</p> <p>Provide some simple examples of how to extend the investigation.</p>	<p><b>Possible Misconceptions:</b> Light</p> <ol style="list-style-type: none"> <li>1.misconception sight is purely an active human process 'I am looking at something, which is why I can see it' or that eyes give out a form of light to enable us to see</li> <li>2.misconception reflective surfaces emit light</li> <li>3.misconception only shiny surfaces or water reflect light</li> <li>4.misconception. opaque objects do not reflect light</li> <li>5.misconception opaque surfaces give out colour or 'darkness'</li> </ol>			
<p><b>Oracy opportunities for Autumn Term</b></p>		<p>Ignite speech: explain the lifecycle of an animal/plant of your choice, discussing each stage and how the animal/plant develops.</p>					



<p><b>Spring</b></p> <p><b>Electricity</b></p>	<p>Pupils should be taught to:</p> <p>associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>use recognised symbols when representing a simple circuit in a diagram</p>	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p>	<p><u>Asking Questions</u> Children will ask relevant scientific questions and choose which enquiry type would be best suited to answer them.</p> <p><u>Making Predictions</u> Children will make predictions based on scientific knowledge.</p> <p><u>Setting up tests</u> Plan different types of scientific enquiries to answer questions, Including recognising and controlling variables where necessary.</p> <p><u>Observing and Measuring</u> Children will use a range of scientific equipment to make systematic and careful observations with increased complexity.</p> <p><u>Recording</u> Children will record data and results of Increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p><u>Interpreting Results</u> Children will use scientific evidence to answer questions</p>	<p>How has electricity changed over time?</p> <p>What are the different symbols on an electrical circuit?</p> <p>What are the effects of differing voltages in a circuit?</p> <p>What happens if you increase or decrease the voltage on differing parts of the circuit?</p>	<p>Lightning is caused by the discharge of electricity in the atmosphere.</p> <p>Electricity was first discovered in 600BC by the Ancient Greeks.</p> <p>Kilowatt is a unit used for measuring electrical power.</p>	<p>Alternating Direct current Battery Motor Buzzer Voltage</p>	<p>Engineering/Problem solving</p> <p>STEM visit Careers/ Aspirations/science week</p> <p>Spring 1 Re Think Food indoor garden project Planting and growing plants in classroom and outdoors.</p> <p>50 things: Invent something</p>		<p>Outstanding science Hamilton trust</p>
--	---	--	---	--	--	--	--	--	---

**Possible Misconceptions:**  
**Electricity**  
**Misconceptions 1** Different coloured wires affect how the circuit works.  
**Misconceptions 2** Wire is made of plastic.  
**Misconceptions 3** If a circuit is broken, energy goes off into the air.  
**Misconceptions 4** Electricity comes out of both sides of the battery and leads to both sides of the component.  
**Misconceptions 4** Current, voltage and electricity are all the same thing.  
**Misconceptions 5** Current gets less as it passes through components.  
**Misconceptions 6** Electricity is an object that can be seen.

			<p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p><u>Evaluating</u> Children will use test results to make predictions to set up further comparative and fair tests.</p> <p>Suggest investigation improvements including accuracy of results.</p> <p>Provide some simple examples of how to extend the investigation.</p>				
<p><b>Oracy opportunities for spring Term</b></p>		<p>Ignite speech: choose a force, and tell the class how we come across that force in our daily life.</p>					

<p><b>Summer</b></p> <p><b>Evolution and Inheritance</b></p>	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>	<p><u>Asking Questions</u> Children will ask relevant scientific questions and choose which enquiry type would be best suited to answer them.</p> <p><u>Making Predictions</u> Children will make predictions based on scientific knowledge.</p> <p><u>Setting up tests</u> Plan different types of scientific enquiries to answer questions, Including recognising and controlling variables where necessary.</p> <p><u>Observing and Measuring</u> Children will use a range of scientific equipment to make systematic and careful observations with increased complexity.</p> <p><u>Recording</u> Children will record data and results of Increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p><u>Interpreting Results</u> Children will use scientific evidence to answer questions</p>	<p>Who was Charles Darwin?</p> <p>How are fossils formed and how long (on average) do they take to form?</p> <p>Are inherited characteristics always physical?</p> <p>What is the difference between inherited and acquired characteristics?</p> <p>How do animals and plants adapt to their environment?</p> <p>How could adaptation lead to evolution?</p> <p>What is a fungus?</p>	<p>All living things have a common ancestor – a bacterium that lived billions of years ago.</p> <p>The closest living relation of birds is the crocodile.</p> <p>Darwin said that monkeys, apes and humans had a common ancestor.</p> <p>Humans, unlike other animals, have opposable thumbs making it easier for us to pick things up and hold things.</p> <p>Up until 10,000 years ago, all humans had brown eyes.</p> <p>Microorganisms are found in almost every habitat present in nature.</p>	<p>Evolution Adaptation Inherited traits Inheritance Adaptive traits Natural selection DNA Genes Variation Micro organism Taxonomy</p>	<p>50 things: Eat something you have grown (ready steady cook)</p> <p>Planting and growing plants in classroom and outdoors.</p> <p>Nature Walk</p> <p>Gardening</p>	<p>Sex: Ruth Ella Moore (micro biologist)</p>	<p>Outstanding science Hamilton trust Science folder resources</p>
<p><b>Living Things and Their Habitats</b></p>	<p>describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</p> <p>give reasons for classifying plants and animals based on specific characteristics</p>	<p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p>				<p><b>Possible Misconceptions:</b> <b>Evolution</b> Misconceptions 1 Environmental change can be inherited, e.g. if a sheep loses its tail, its lambs will be born without a tail Misconceptions 2 Humans used to be monkeys Misconceptions 3 An individual can evolve during its own lifespan Misconceptions 4 Evolution produces living things perfectly adapted to their environment Misconceptions 5. Natural selection is an active process, ie an individual or a species can try to adapt . Misconceptions 6 Natural selection is always good for the species Misconceptions 7 . Evolution and religion are incompatible</p>			

			<p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p><u>Evaluating</u> Children will use test results to make predictions to set up further comparative and fair tests.</p> <p>Suggest investigation improvements including accuracy of results.</p> <p>Provide some simple examples of how to extend the investigation.</p>				
<b>Oracy opportunities for summer Term</b>		Hot seating: asking Darwin questions about evolution and inheritance.					