

Science

Curriculum Map and Assessment Framework

Science – EYFS

ELG	Pupil outcomes / Year 1 readiness Geographical knowledge and understanding	Other opportunities to develop geographical understanding
<p>Pre-School Children use all their senses in hands-on exploration of natural materials. They explore collections of materials with similar and/or different properties and talk about what they see. Children plant seeds and care for growing plants. They understand the key features of the life cycle of a plant and an animal. They begin to understand the need to respect and care for the natural environment and all living things. Children explore and talk about different forces they can feel. Children explore and talk about the differences between materials and changes they notice.</p> <p>Reception Children explore the natural world around them, making observations and drawing pictures of animals and plants. Children know some similarities and differences between the natural world around them, contrasting environments and exploring simple similarities and differences between materials. Children understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<ul style="list-style-type: none"> • Knowledge of plants and growth. Children have opportunities throughout the year to plant and grow their own plants, fruit and vegetables outside. • There are lots of opportunities which promote healthy eating and self-care, including continuous healthy snacks. • Provision enables children to experiment scientifically, e.g. freezing and melting, floating and sinking etc. • Children explore animals from around the world and look at their habitats. They also look at pets at home and how they are cared for in the home. • Children are aware of some simple life cycles. <p>Yr1 Readiness</p> <ul style="list-style-type: none"> • Can name the parts of a plant – roots, stems, leaves, bulb, flower • Can identify what a plant needs to grow and survive – water and light • Name the four seasons – Autumn, Winter, Spring, Summer • Can discuss why water freezes and know it is called ice • Can discuss why ice melts and know it turns to water • Can use the term floating and sinking accurately • Can name different animals from hot and cold locations and discuss their habitats • Can describe the life cycle of a butterfly • Naming and sorting of common materials (metals, wood and fabrics) • Exploring some simple properties of materials (e.g. texture, opaqueness, transparency, elasticity) 	<p>The nurse visits to teach children basic hygiene (focusing on hand washing).</p> <p>The dental nurse visits to teach children how to brush their correctly and the importance of oral hygiene.</p> <p>A range of stories are shared with the children which leads into discussions and learning opportunities which relate to science (i.e. The Very Hungry Caterpillar- Life Cycle of a Butterfly).</p> <p>Children hatch butterflies and chicks in the classroom.</p> <p>Discussions at snack time of the importance of healthy food choices (to include lunch time). Through stories and circle time discussions e.g. The story - Now Wash Your Hands and Funnybones.</p> <p>PE lessons that encourage getting dressed and undressed properly.</p>

Key Stage 1








Pupils should experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. 'Working scientifically' is described separately in the programme of study but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Working Scientifically







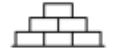
During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- **asking simple questions and recognising that they can be answered in different ways**
- **observing closely, using simple equipment**
- **performing simple tests**
- **identifying and classifying**
- **using their observations and ideas to suggest answers to questions**
- **gathering and recording data to help in answering questions.**







Year 1


Substantive Concepts:		PHYSICS – Seasonal Changes						
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist				End Point Knowledge		
<p>Year 1 Autumn Term</p> <p>1.1 – What happens when the seasons change?</p>	<ul style="list-style-type: none"> observe changes across the 4 seasons observe and describe weather associated with the seasons and how day length varies 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	<p>Pupils should know that:</p> <ul style="list-style-type: none"> in autumn, leaves change colour and fall from the trees; it gets cooler. It can be warm and mild or wet and windy. in winter, it is cold and there is less daylight, so it gets dark sooner. in spring, it is warmer; plants begin to grow and it gets lighter. in summer, it is hotter; the trees have lots of leaves and there is more daylight. Earth spins once in a day; when the sun shines on you it is day, but when the sun has set it is night time, so it gets dark; the sun does not move.
<p>Curriculum Narrative</p> <p>Previous Learning</p>	<p>Previous learning: Curriculum Narrative</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>The Natural World</p>  <p>Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>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.</p> </div> <div style="text-align: center;"> <p>The Natural World</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p> </div> </div>				<p>Tier 2 Vocabulary</p> <p>dawn dusk mild rotate soaked weather</p>	<p>Tier 3 Vocabulary</p> <p>month season spring summer autumn winter</p>		

Year 1

Substantive Concepts:		BIOLOGY – Plants						
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist				End Point Knowledge		
Year 1 Autumn Term 1.2 – What makes a tree?	<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, including trees. 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	Pupils should know that: <ul style="list-style-type: none"> trees are made up of leaves, twigs, branches, a trunk, roots and the crown (branches, twigs and leaves); tree bark protects the tree; branches grow from the trunk. identify trees by their leaves. e.g. oak, beech, horse chestnut and scots pine. deciduous means they lose their leaves annually in Autumn but regrow them in spring and evergreen means they keep their leaves and stay green all year round.
Curriculum Narrative Previous Learning	EYFS: Understanding the World – The Natural World 				Tier 2 Vocabulary	Tier 3 Vocabulary		
	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.		bud trunk branch bark seed wild	nutrients stem deciduous evergreen		








Year 1

Substantive Concepts:		BIOLOGY – Animals, Including Humans						
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge
<p>Year 1 Autumn Term</p> <p>1.3 – How do I know if it's an animal?</p>	<ul style="list-style-type: none"> identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	<p>Pupils should know that:</p> <ul style="list-style-type: none"> animals need to move freely, eat other living things for food, drink water and have sunlight. there are five animal groups – mammals, fish, reptiles, birds and amphibians. mammals are warm-blooded, have skin/hair/fur, give birth to live young and breathe air (humans, cats, dogs etc.) birds are warm-blooded, have feathers, beaks and wings, lay eggs and breathe air (robins, sparrows, ducks etc.) amphibians are cold-blooded, have slimy skin, lay soft eggs and breathe underwater as a baby, then the air when an adult (frogs, toads etc.) reptiles are cold-blooded, have scaly skin, lay eggs with harder shells and breathe air (snakes, lizards etc.) fish are cold-blooded, have fins and scales, lay soft eggs in water and breathe underwater (salmon, cod etc.) carnivores eat other animals; herbivores eat plants; omnivores eat plants and animals. humans are mammals, so are warm-blooded, have skin and hair, are born alive and breathe air. humans have five senses: sight, hearing, smell, taste and touch.







<p>Curriculum Narrative</p> <p>Previous Learning</p>	<p>Previous learning The Natural World</p>  <p>Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p>Tier 2 Vocabulary</p>	<p>Tier 3 Vocabulary</p>
		<p>blood senses young feathers fur scales</p>	<p>mammal amphibian reptile herbivore carnivore omnivore</p>


Year 1

CHEMISTRY – Everyday Materials








Substantive Concepts:		CHEMISTRY – Everyday Materials						
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist				End Point Knowledge		
Year 1 Spring Term 1.4 – How can I describe this material?	<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 on the basis of their simple physical properties 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	Pupils should know that: <ul style="list-style-type: none"> there are different materials including cotton, wool, wood, clay, glass, plastic, water, rock. objects are made from a range of different materials. properties of materials can be described as smooth, rough, shiny, hard, soft, stretchy, bendy, opaque etc. some materials are man-made and others aren't. waterproof means that water does not travel through: it is repelled. transparent materials can be seen though; opaque ones are not see through. some materials are suited to particular jobs because of their properties e.g. wood for a table as it is strong.
Curriculum Narrative Previous Learning	<p>ELG The Natural World 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>	<p>Previous learning</p>  <p>ELG: Creating with materials Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; Share their creations, explaining the process they have used; Make use of props and materials when role playing characters in narratives and stories.</p>	<p>Tier 2 Vocabulary</p> <p>absorb rough smooth waterproof metal plastic</p>	<p>Tier 3 Vocabulary</p> <p>materials properties flexible transparent opaque physical</p>				

Year 1

Substantive Concepts:		BIOLOGY – Animals, Including Humans						
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist				End Point Knowledge		
<p>Year 1 Spring Term</p> <p>1.5 Revisit – How do I know if it is an animal?</p>	<ul style="list-style-type: none"> identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	<p>Pupils should know that:</p> <ul style="list-style-type: none"> Animals need to move freely, eat other living things for food, drink water and have sunlight. There are five animal groups – mammals, fish, reptiles, birds and amphibians. Mammals are warm-blooded, have skin/hair/fur, give birth to live young and breathe air (humans, cats, dogs etc.) Birds are warm-blooded, have feathers, beaks and wings, lay eggs and breathe air (robins, sparrows, ducks etc.) Amphibians are cold-blooded, have slimy skin, lay soft eggs and breathe underwater as a baby, then the air when an adult (frogs, toads etc.) Reptiles are cold-blooded, have scaly skin, lay eggs with harder shells and breathe air (snakes, lizards etc.) Fish are cold-blooded, have fins and scales, lay soft eggs in water and breathe underwater (salmon, cod etc.) Carnivores eat other animals; herbivores eat plants; omnivores eat plants and animals. Humans are mammals, so are warm-blooded, have skin and hair, are born alive and breathe air. Humans have five senses: sight, hearing, smell, taste and touch.
Curriculum Narrative						Tier 2 Vocabulary	Tier 3 Vocabulary	
Previous Learning								







	<p>Explore the natural world around them, making observations and drawing pictures of animals and plants</p>	<p>Previous learning ELG: The Natural World</p>  <p>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</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</p>	<p>blood senses young feathers fur scales</p>	<p>mammal amphibian reptile herbivore carnivore omnivore</p>


Year 1

Substantive Concepts:		BIOLOGY – Plants						
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist				End Point Knowledge		
Year 1 Summer Term 1.6 – What makes a plant?	<ul style="list-style-type: none"> identify and name a variety of common wild and garden plants identify and describe the basic structure of a variety of common flowering plants. 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	Pupils should know that: <ul style="list-style-type: none"> plants are made up of a stem, flower, leaves, roots, seeds, leaves and buds. plants have similarities and differences between them e.g. - shape, size, colour and smell. plants need food, water and light to survive. wild plants grow naturally without any human help; some common examples are buttercups, stinging nettles, dandelions, daisies and ivy. some plants are helped to grow and need care to survive: sunflowers, tulips, grass, pansies, roses, lavender etc.
Curriculum Narrative Previous Learning	EYFS: Understanding the World – The Natural World  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.	Tier 2 Vocabulary	Tier 3 Vocabulary
							bud trunk branch bark seed wild	nutrients stem deciduous evergreen

Year 1







BIOLOGY – Plants and Animals, Including Humans


Substantive Concepts:		BIOLOGY – Plants and Animals, Including Humans						End Point Knowledge
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						
<p>Year 1 Summer Term</p> <p>1.7 Revisit– How do plants and animals change during the year?</p>	<ul style="list-style-type: none"> identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) 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. 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	<p>Pupils should know that:</p> <ul style="list-style-type: none"> there are five animal groups – mammals, fish, reptiles, birds and amphibians. mammals are warm-blooded, have skin/hair/fur, give birth to live young and breathe air (humans, cats, dogs etc.) birds are warm-blooded, have feathers, beaks and wings, lay eggs and breathe air (robins, sparrows, ducks etc.) amphibians are cold-blooded, have slimy skin, lay soft eggs and breathe underwater as a baby, then the air when an adult (frogs, toads etc.) reptiles are cold-blooded, have scaly skin, lay eggs with harder shells and breathe air (snakes, lizards etc.) fish are cold-blooded, have fins and scales, lay soft eggs in water and breathe underwater (salmon, cod etc.) carnivores eat other animals; herbivores eat plants; omnivores eat plants and animals. plants are made up of a stem, flower, leaves, roots, seeds, leaves and buds. plants have similarities and differences between them e.g. - shape, size, colour and smell. plants need food, water and light to survive. wild plants grow naturally without any human help; some common examples are buttercups, stinging nettles, dandelions, daisies and ivy. some plants are helped to grow and need care to survive: sunflowers, tulips, grass, pansies, roses, lavender etc.

			<ul style="list-style-type: none"> trees are made up of leaves, twigs, branches, a trunk, roots and the crown (branches, twigs and leaves); tree bark protects the tree; branches grow from the trunk. deciduous means they lose their leaves annually in Autumn but regrow them in spring and evergreen means they keep their leaves and stay green all year round. 	
Curriculum Narrative Previous Learning	Previous learning ELG: The Natural World 		Tier 2 Vocabulary	Tier 3 Vocabulary
	Notice similarities and differences in relation to places, objects, materials and living things.	Children make observations of animals and plants and explain why some things occur, and talk about changes.	Year 1 Animals, including humans Plants	bud trunk branch bark seed wild blood senses young feathers fur scales







Year 2

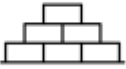
BIOLOGY – Living Things and Their Habitats

Substantive Concepts:		BIOLOGY – Living Things and Their Habitats						End Point Knowledge
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge
<p>Year 2 Autumn Term</p> <p>2.1 – What do living things need to survive?</p>	<ul style="list-style-type: none"> explore and compare the differences 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 microhabitats 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 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	<p>Pupils should know that:</p> <ul style="list-style-type: none"> living things move, grow, consume nutrients and reproduce (move, respire, sensitivity, grow, reproduce, excrete and nutrition (MRS GREN); that dead things used to do these things, but no longer do; and that things that never lived have never done these things. to live and grow plants need: sunlight, air and water, and animals need: food, air, water and shelter animals adapt to their environment e.g. polar bear - thick fur for warmth and oily paw pads to ensure that they don't freeze to the ice.; sharks – smooth skin and streamlined shape for quick swimming; and gills for breathing underwater plants adapt to their environment e.g. cacti - thick skin keeps a store of water safe; sharp spikes keep animals from stealing the water; pine trees - have thick bark and pine cones to protect against cold wind a habitat is a home (place) where animals and plants live e.g. forest, ocean, desert microhabitats are very small habitats, for example woodlice under logs as they need somewhere dark and damp so that they do not dry out; frogs can live in ponds as they need water in which to lay their eggs (frogspawn) plants make their own food (producers); that the plants are consumed by animals which are herbivores (just plants) and omnivores (plants and meat); and that carnivorous animals (predators) eat other animals (prey).







			<p>Herbivores, omnivores and carnivores are also consumers.</p> <ul style="list-style-type: none"> the arrows on a food chain show the direction that the energy travels. all living things in a habitat depend on each other to survive (plants for food and oxygen, animals for food and to disperse seeds). 		
<p>Curriculum Narrative</p> <p>Previous Learning</p>	<p>EYFS: The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants.</p>	 <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p> <p>Year 1 Plants Everyday materials Animals, including humans</p>	<p>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.</p>	<p>Tier 2 Vocabulary</p>	<p>Tier 3 Vocabulary</p>
				<p>thrive depend producer consume prey predator</p>	<p>oxygen nutrition respiration sensitivity reproduction excretion</p>

Year 2







Substantive Concepts:		BIOLOGY – Animals, Including Humans						
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge
<p>Year 2 Autumn Term</p> <p>2.2 – What do animals need to survive and grow?</p>	<ul style="list-style-type: none"> notice that animals, including humans, have offspring which grow into adults find out about 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 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	<p>Pupils should know that:</p> <ul style="list-style-type: none"> animals with backbones are vertebrates and animals without a backbone are invertebrates. the acronym MRS GREN stands for Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion and Nutrition animals produce offspring that grow into adults as part of their life cycle. insects go through four stages of metamorphosis (change physical form or shape to become an adult) some off spring look the same as the adults and others loo different. the six stages in the human life cycle and some features in these stages eg toddler- learns to walk and talk animals, including humans, need: food (to provide nutrients), water, warmth and air to survive the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods and the importance of a balanced diet to keep healthy and to grow. food keeps people healthy as it gives people energy and helps people grow exercising often and good hygiene is an important part of staying healthy exercise keeps is good for our heart, lungs and muscles. exercise keeps us stronger, healthier, strong mind and it will be harder to get sick.

			<ul style="list-style-type: none"> drinking water takes away nasty things inside us and we must replace lost water through sweating and going to the toilet 		
Curriculum Narrative Previous Learning	Year 1 Animals including humans Introduction and revisit		Year 2 Living things and their habitats	Tier 2 Vocabulary	Tier 3 Vocabulary
	Year 1 Plants		healthy survive exercise heart lungs muscles	hygiene larva pupa vertebrates invertebrates metamorphosis	

Year 2

Substantive Concepts:		CHEMISTRY – Uses of Everyday Materials						
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist				End Point Knowledge		
<p>Year 2 Spring Term</p> <p>2.3 – What is the right material for the job?</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 the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	<p>Pupils should know that:</p> <ul style="list-style-type: none"> materials have different properties such as: waterproof; strong; hard; soft; flexible; rigid; light or heavy. the properties of a material decide how useful it is for a given job. applying forces to objects can change their shape. absorbent materials take up liquid. waterproof materials do not let liquid through them.
<p>Curriculum Narrative</p> <p>Previous Learning</p>	<p>ELG: The Natural World</p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p> <p>Year 1 Everyday materials</p> <p>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</p>				<p>Tier 2 Vocabulary</p> <p>artificial brittle extracted fabric manufactured natural</p>	<p>Tier 3 Vocabulary</p> <p>ceramic durable inflexible reflective rigid translucent</p>		







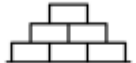
Year 2

Substantive Concepts:		CHEMISTRY – Uses of Everyday Materials BIOLOGY – Living Things and Their Habitats						
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge
<p>Year 2 Spring Term</p> <p>2.4 Revisit – What is it made from?</p> <p>Compare: What is alive, what is not alive, what has never been alive?</p>	<ul style="list-style-type: none"> explore and compare the differences 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 microhabitats 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 identify and compare the suitability of a 							<p>Pupils should know that:</p> <ul style="list-style-type: none"> many types of plastic are waterproof steel (a type of metal) is strong, that rock is hard; that cotton wool is soft, that rubber is flexible, that rock is rigid, that polystyrene (a type of plastic) is light and that iron (a type of metal) is heavy, some objects are made up from more than one type of material living things move, grow, consume nutrients and reproduce dead things used to do these things, but no longer do; things that never lived have never done these things. materials are chosen to make items because of their specific properties
		Asking simple questions and recognising that they can be answered in different ways	Observing closely, using simple equipment	Performing simple tests	Identifying and classifying	Using their observations and ideas to suggest answers to questions	Gathering and recording data to help in answering questions	

	<p>variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <ul style="list-style-type: none"> • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching 			
<p>Curriculum Narrative</p> <p>Previous Learning</p>	<p>ELG: The Natural World</p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants</p> <p>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</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</p>	<p>Year 1</p> <p>Properties of materials</p> <p>Animals, including humans</p> <p>Year 2</p> <p>Animals, including humans</p> <p>Living things and their habitats</p> <p>Uses of everyday materials</p>	<p>Tier 2 Vocabulary</p>	<p>Tier 3 Vocabulary</p>
			<p>artificial brittle extracted fabric manufactured natural thrive depend producer consume prey predator</p>	<p>ceramic durable inflexible reflective rigid translucent oxygen nutrition respiration sensitivity reproduction excretion</p>

Year 2

BIOLOGY – Plants

Substantive Concepts:		Disciplinary Knowledge: Thinking as a Scientist				End Point Knowledge		
Term and Focus	NC objectives Pupils should be taught about:							
<p>Year 2 Summer Term</p> <p>2.5 - What do plants need to survive and grow?</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 a suitable temperature to grow and stay healthy. 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	<p>Pupils should know that:</p> <ul style="list-style-type: none"> seeds are living things germination means growth of a seed to a plant a young plant is called a seedling plants spread their seedling away from the parent plant so that they are not competing for resources a bulb's roots grown down and the shoot grows up, they mature and die back down to a bulb again. a bulb lays dormant until the next growing season plants grow towards the sunlight and get their energy from the sun seeds and bulbs need to be buried underground in soil and that they will thrive and grow into adult plants under the right conditions (water, warmth, light, air, soil and space) plants that are deprived of water, light, food or air will not grow and will die. if a plant has drooping leaves and stem it is unhealthy.
<p>Curriculum Narrative</p> <p>Previous Learning</p>	<p>Y1 Science</p> <p>Animals and living things Use of everyday materials Plants</p>	<p>Previous learning</p>  <p>Y2 Science</p> <p>Animals, including humans Use of everyday materials</p>	<p>Y2 Science</p> <p>Revisit living things and habitats</p>	<p>Tier 2 Vocabulary</p> <p>wither dominant mature bulb anchor sustain</p>	<p>Tier 3 Vocabulary</p> <p>germination perennial carbon dioxide glucose clone</p>			

Year 2

BIOLOGY – Plants

Substantive Concepts:		BIOLOGY – Plants	
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist	End Point Knowledge
<p>Year 2 Summer Term</p> <p>2.6 Revisit – How do seeds and bulbs grow? What do I know about animals including humans?</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 a suitable temperature to grow and stay healthy. • notice that animals, including humans, have offspring which grow into adults • find out about 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. 		<p>Pupils should know that:</p> <ul style="list-style-type: none"> • seeds are living things • germination means growth of a seed to a plant • a young plant is called a seedling • plants spread their seedling away from the parent plant so that they are not competing for resources • a bulb’s roots grown down and the shoot grows up, they mature and die back down to a bulb again. • a bulb lays dormant until the next growing season • plants grow towards the sunlight and get their energy from the sun • seeds and bulbs need to be buried underground in soil and that they will thrive and grow into adult plants under the right conditions (water, warmth, light, air, soil and space) • plants that are deprived of water, light, food or air will not grow and will die. • the acronym MRS GREN stands for Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion and Nutrition • food keeps people healthy, gives people energy and helps people grow • some off spring look the same as the adults and others loo different.

			<ul style="list-style-type: none"> the six stages in the human life cycle and some features in these stages eg toddler- learns to walk and talk animals, including humans, need: food (to provide nutrients), water, warmth and air to survive the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods and the importance of a balanced diet to keep healthy and to grow. food keeps people healthy as it gives people energy and helps people grow exercising often and good hygiene is an important part of staying healthy exercise keeps is good for our heart, lungs and muscles. 	
Curriculum Narrative Previous Learning			Tier 2 Vocabulary	Tier 3 Vocabulary
			healthy survive exercise heart lungs muscles wither dominant mature bulb anchor sustain	hygiene larva pupa vertebrates invertebrates metamorphosis germination perennial carbon dioxide glucose clone

Key Stage 2







The pupils should be enabled to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. 'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

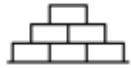
Working Scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.

Year 3

Substantive Concepts:		CHEMISTRY – Rocks						
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist				End Point Knowledge		
<p>Year 3 Autumn Term</p> <p>3.1 – What makes a rock?</p>	<ul style="list-style-type: none"> compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter 	 Asking simple questions and recognising that they can be answered in different ways	 Observing closely, using simple equipment	 Performing simple tests	 Identifying and classifying	 Using their observations and ideas to suggest answers to questions	 Gathering and recording data to help in answering questions	<p>Pupils should know that:</p> <ul style="list-style-type: none"> there are three kinds of rocks: igneous, sedimentary and metamorphic the Earth has a solid crust made up of tectonic plates with molten rock beneath granite and basalt are types of igneous rock and that igneous rocks form from molten rock below the Earth’s crust limestone and sandstone are types of sedimentary rock which form when small, weathered fragments of rock or shell settle and stick together, often in layers marble and slate are types of metamorphic rock which form when rocks in Earth’s crust get squashed and heated in processes such as when tectonic plates press against each other fossils form when a plant or animal dies and is quickly covered with silt or mud so that it cannot be rotted by microbes or eaten by scavenging animals; in time layers of sediment build, squashing the mud and turning it to stone around the dead plant or animal; the materials in the body are replaced by minerals that flow in water through the rock, leaving a rock in the shape of the animal or plant that was once there soil is made from tiny particles of rock broken down by the action of weather (weathering)
Curriculum Narrative						Tier 2 Vocabulary	Tier 3 Vocabulary	
Previous Learning								

	<p>Y2 Science Living things and habitats</p>	 <p>Y2 Science Plants</p>	<p>Year 2 Science Animals, including humans</p>	<p>cemented compacted decay prehistoric soil transform</p>	<p>fossil igneous magma metamorphic minerals sedimentary</p>
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Year 3

BIOLOGY – Animals, Including Humans

Substantive Concepts:			
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist	End Point Knowledge









<p>Year 3 Autumn Term</p> <p>3.2 – How does my body move?</p>	<ul style="list-style-type: none"> 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 identify that humans and some other animals have skeletons and muscles for support, protection and movement. 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> </tr> <tr> <td style="text-align: center;">Ask relevant questions</td> <td style="text-align: center;">Set up simple, practical enquiries and comparative and fair tests</td> <td style="text-align: center;">Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers</td> <td style="text-align: center;">Gather, record, classify and present data in a variety of ways to help in answering questions</td> <td style="text-align: center;">Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables</td> <td style="text-align: center;">Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</td> <td style="text-align: center;">Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests</td> <td style="text-align: center;">Identify differences, similarities or changes related to simple, scientific ideas and processes</td> </tr> </table>									Ask relevant questions	Set up simple, practical enquiries and comparative and fair tests	Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	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, bar charts and tables	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	Identify differences, similarities or changes related to simple, scientific ideas and processes	<p>Pupils should know that:</p> <ul style="list-style-type: none"> proteins (meat, fish, eggs and dairy) help us to grow; carbohydrates (bread, cereals, vegetables and sugar) provide us with energy; vitamins, minerals and fibre (fruit and vegetables) keep us healthy; fats can provide energy, help our nerves and brain and absorb vitamins, but we need less of these in our diet; water is essential as our body is mostly made from water. getting the right amount of each food group is called a balanced diet. the blood, muscles and organs need water and nutrients to work (our muscles are 79% water). vertebrates are animals with backbones; invertebrates are animals without backbones. skeletons support the body; protect the brain and lungs; allow movement through joints; create red blood cells. the skull, pelvis, femur, ribcage and humerus are examples of bones in our bodies. muscles can be skeletal (voluntary movement that we control); cardiac muscles (involuntary movement e.g. the heart); smooth muscle (involuntary movements such as the intestines and bladder). muscles contract and relax in antagonistic pairs (e.g. the bicep and tricep).
Ask relevant questions	Set up simple, practical enquiries and comparative and fair tests	Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	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, bar charts and tables	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	Identify differences, similarities or changes related to simple, scientific ideas and processes												

<p>Curriculum Narrative</p> <p>Previous Learning</p>		<p>Tier 2 Vocabulary</p>	<p>Tier 3 Vocabulary</p>
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	<p>Year 1 Animals including humans Introduction</p>		<p>Year 2 Animals including humans Introduction</p>	<p>minerals skeleton skull voluntary involuntary nerves</p>
	<p>Year 1 Animals including humans revisit</p>			<p>biceps triceps vertebrae vitamins proteins carbohydrates</p>

Year 3

CHEMISTRY – Rocks









Substantive Concepts:		CHEMISTRY – Rocks								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
<p>Year 3 Autumn Term</p> <p>3.3 Revisit: Rocks – How are rocks formed and what types are there? How can rocks change? How are fossils formed?</p>	<ul style="list-style-type: none"> compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter 									<p>Pupils should know that:</p> <ul style="list-style-type: none"> there are three kinds of rocks: igneous, sedimentary and metamorphic the Earth has a solid crust made up of tectonic plates with molten rock beneath granite and basalt are types of igneous rock and that igneous rocks form from molten rock below the Earth’s crust limestone and sandstone are types of sedimentary rock which form when small, weathered fragments of rock or shell settle and stick together, often in layers marble and slate are types of metamorphic rock which form when rocks in Earth’s crust get squashed and heated in processes such as when tectonic plates press against each other fossils form when a plant or animal dies and is quickly covered with silt or mud so that it cannot be rotted by microbes or eaten by scavenging animals; in time layers of sediment build, squashing the mud and turning it to stone around the dead plant or animal; the materials in the body are replaced by minerals that flow in water through the rock, leaving a rock in the shape of the animal or plant that was once there soil is made from tiny particles of rock broken down by the action of weather (weathering)
Curriculum Narrative								Tier 2 Vocabulary	Tier 3 Vocabulary	
Previous Learning										

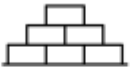
Ask relevant questions	Set up simple, practical enquiries and comparative and fair tests	Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	Gather, record, classify and present data in a variety of ways to help in answering questions	Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	Identify differences, similarities or changes related to simple, scientific ideas and processes
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	<p>Year 1 Everyday materials</p>		<p>Year 2 Uses of everyday materials</p>	<p>cemented compacted decay prehistoric soil transform</p>	<p>fossil igneous magma metamorphic minerals sedimentary</p>
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Year 3









PHYSICS – Forces and Magnets

Substantive Concepts:		Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
Term and Focus	NC objectives Pupils should be taught about:									
<p>Year 3 Spring Term</p> <p>3.4 - What are forces?</p>	<ul style="list-style-type: none"> compare how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials describe magnets as having two poles predict whether two magnets will 									<p>Pupils should know that:</p> <ul style="list-style-type: none"> a force can be thought of as a push or a pull a contact force occurs when two objects physically touch. a force that acts on an object without touching it is called a non-contact force. friction is the force that stops things from moving resistance is a force that slows down an object that is moving. objects move differently on rough and smooth surfaces; objects resist movement more on rough surfaces because there is higher friction as the object moves magnets have two poles called north and south like poles (south-south and north-north) of two magnets repel each other and that opposite poles of two magnets (north-south) attract each other there is a magnetic field around a magnet which is strongest at each pole some materials are magnetic, meaning that they are attracted to a magnet, while other materials are non-magnetic
		<p>Ask relevant questions</p>	<p>Set up simple, practical enquiries and comparative and fair tests</p>	<p>Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers</p>	<p>Gather, record, classify and present data in a variety of ways to help in answering questions</p>	<p>Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables</p>	<p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p>	<p>Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests</p>	<p>Identify differences, similarities or changes related to simple, scientific ideas and processes</p>	

	attract or repel each other, depending on which poles are facing.				
Curriculum Narrative Previous Learning	Year 1 Everyday materials		Year 2 Uses of everyday materials	Tier 2 Vocabulary	Tier 3 Vocabulary
				consequence contact force attract north south	magnet resistance friction repel pole magnetic field









Year 3


PHYSICS – Light

Substantive Concepts:		PHYSICS – Light								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
<p>Year 3 Spring Term</p> <p>3.5 -How are shadows formed and changed?</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 an opaque object find patterns in the way that the size of shadows change 									<p>Pupils should know that:</p> <ul style="list-style-type: none"> we need light to see things and that darkness is the absence of light light travels in straight lines light is reflected when it travels from a light source and then ‘bounces’ off an object everything that we can see is either a light source or something that is reflecting light from a light source into our eyes the Sun is a light source, but that the Moon is not and is merely reflecting light from the Sun sunglasses can protect eyes from sunlight but looking at the Sun directly – even with sunglasses – can damage the eyes opaque objects block light creating shadows and that light passes through transparent objects opacity/transparency and reflectiveness are properties of a material shadows change in length depending on the position of the light source.
Curriculum Narrative								Tier 2 Vocabulary	Tier 3 Vocabulary	
Previous Learning										

	<p>Year 3 Animals, including humans Forces and magnets</p>		<p>Year 3 Plants</p>	<p>absence cast impenetrable reflect shadow source</p>	<p>Constant Dependent Independent translucent</p>
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Year 3


Substantive Concepts:		BIOLOGY – Plants								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
<p>Year 3 Summer Term</p> <p>3.6 -How do the parts of a plant help it survive?</p>	<ul style="list-style-type: none"> identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 	 Ask relevant questions	 Set up simple, practical enquiries and comparative and fair tests	 Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	 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, bar charts and tables	 Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	 Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	 Identify differences, similarities or changes related to simple, scientific ideas and processes	<p>Pupils should know that:</p> <ul style="list-style-type: none"> different parts of plants have one or more functions (jobs) the roots collect water and minerals from the soil, and anchor the plant firmly in the ground the stem holds up the leaves so that they can gather light to make food and holds up the flowers so that they can receive pollen and disperse their fruits; the stem also transports water and minerals from the roots to the other parts of the plant the leaves make food by trapping light and using its energy to turn carbon dioxide and water into carbohydrates the function of a flower is reproduction, where flowers of the same kind exchange pollen – made by an anther – in a process called fertilisation, and a structure in the flower’s ovary called an ovule becomes a seed; the ovary then becomes a fruit which helps the seed leave the plant in a process called dispersal the names of the different male and female parts of a flower

Curriculum Narrative Previous Learning	Year 2 Plants and bulbs		Year 3 Animals, including humans	Tier 2 Vocabulary	Tier 3 Vocabulary
				adapt essential glucose transport variety vital	transpiration stoma pollination stamen pistil photosynthesis

Year 4







BIOLOGY – Living Things and Their Habitats


Substantive Concepts:										
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
<p>Year 4 Autumn Term</p> <p>4.1 -How can animals be grouped?</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 recognise that environments can change and that this can sometimes pose dangers to living things. 	 Ask relevant questions	 Set up simple, practical enquiries and comparative and fair tests	 Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	 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, bar charts and tables	 Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	 Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	 Identify differences, similarities or changes related to simple, scientific ideas and processes	<p>Pupils should know that:</p> <ul style="list-style-type: none"> vertebrates have a backbone and invertebrates do not all living things: move, respire, are sensitive, grow, reproduce, excrete, need nutrition An organism is a single living thing Biodiversity is the enormous variety of life on earth vertebrates include the animal groups: fish, mammals, birds, amphibians; reptiles. They will learn the features of each animal group and examples of animals who are part of the group. Invertebrates include the animal groups: insects; annelids (worms); arachnids; molluscs. They will learn the features of each animal group and examples of animals who are part of the group. Warm-blooded animals keep a consistent temperature no matter what the air temperature is Cold blooded animals change their body temperature to match their environment Plants are categorised as to whether they are flowering or non-flowering. Flowering plants reproduce using flowers to make seeds. They will learn examples of plants are part of this group. Non-flowering plants reproduce using spores and seed cones. They will learn examples of plants are part of this group. Plants are green make their own food Carl Linnaeus invented the way we classify living things in 1737 Scientists use classification keys to identify, explain and sort living things living things are divided into kingdoms: the animal kingdom, plants, fungi, bacteria, and single-celled organisms

			<ul style="list-style-type: none"> • a species is a group of living things have many similarities that can reproduce together produce offspring • A habitat is a natural place where an organism lives • Environment is the conditions and surroundings which affect the survival and growth of living things. If an environment changes, then the living things may be affected: this could be positive or negative. • Ecosystems are how living things interact with their habitat and environment • Pollution is where harmful or poisonous things have a negative impact on the environment and effect the ecosystem 		
Curriculum Narrative Previous Learning	Year 3 Rocks	 Year 3 Animals, including humans	Year 3 Plants	Tier 2 Vocabulary	Tier 3 Vocabulary
				classification environment interdependence interact beneficial hierarchy	vertebrate invertebrate biotic ecosystem species niche

Year 4

PHYSICS – States of Matter

Substantive Concepts:		Disciplinary Knowledge: Thinking as a Scientist					End Point Knowledge
Term and Focus	NC objectives Pupils should be taught about:						
<p>Year 4 Autumn Term</p> <p>4.2 – What are solids, liquids and gases?</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 they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<p>Ask relevant questions</p>	<p>Set up simple, practical enquiries and comparative and fair tests</p>	<p>Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers</p>	<p>Gather, record, classify and present data in a variety of ways to help in answering questions</p>	<p>Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables</p>	<p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p>
<p>Curriculum Narrative</p> <p>Previous Learning</p>							<p>Pupils should know that:</p> <ul style="list-style-type: none"> things are composed of a material in one of three states of matter: solid, liquid or gas things are made of particles (tiny building blocks) and that these are organized differently in different states materials can change state when temperature changes there are bonds between the particles (building blocks) in a solid; as temperature increases, these bonds are somewhat overcome as the particles absorb energy and solids can change into liquids; with a further increase in temperature, the particles become even more energetic and the bonds are overcome entirely so the liquid changes into a gas when solids turn into liquids, this is called melting and that the reverse process is called freezing when liquids turn into gases, this is called evaporation and that the reverse process is called condensation the freezing point of water is 0° C and that the boiling point of water is 100° C
							<p>Tier 2 Vocabulary</p> <p>Tier 3 Vocabulary</p>

	<p>Year 1 Everyday materials</p>	 <p>Year 2 Uses of everyday materials</p>	<p>Year 3 Rocks Revisit Rocks</p>	<p>permanent particle solid liquid gas vapour</p>	<p>evaporate condense melt matter state volume</p>
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Year 4

Substantive Concepts: BIOLOGY – Animals, Including Humans









Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist	End Point Knowledge
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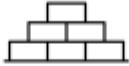
<p>Year 4 Spring Term</p> <p>4.3 – What are the parts of the digestive system and how does it work? What is a food chain?</p>	<ul style="list-style-type: none"> • identify the different types of teeth in humans and their simple functions • describe the simple functions of the basic parts of the digestive system in humans • construct and interpret a variety of food chains, identifying producers, predators and prey. 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> </tr> <tr> <td style="text-align: center;">Ask relevant questions</td> <td style="text-align: center;">Set up simple, practical enquiries and comparative and fair tests</td> <td style="text-align: center;">Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers</td> <td style="text-align: center;">Gather, record, classify and present data in a variety of ways to help in answering questions</td> <td style="text-align: center;">Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables</td> <td style="text-align: center;">Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</td> <td style="text-align: center;">Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests</td> <td style="text-align: center;">Identify differences, similarities or changes related to simple, scientific ideas and processes</td> </tr> </table>									Ask relevant questions	Set up simple, practical enquiries and comparative and fair tests	Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	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, bar charts and tables	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	Identify differences, similarities or changes related to simple, scientific ideas and processes	<p>Pupils should know that:</p> <ul style="list-style-type: none"> • Know that the process of digestion begins with food being chewed in the mouth by the teeth and saliva added • a human has four types of teeth (incisors, canines, pre-molars and molars) and that these each perform different functions • incisors cut/slice food, canines tear food (especially meat) and that pre-molars and molars crush/grind food • children develop an initial set of teeth (20) which are gradually replaced between the ages of 6 and 12 with adult teeth (32) • Saliva starts to break down food with enzymes • The tongue moves food into the oesophagus • Herbivores eat vegetation and have incisors to snip and lots of molars to grind • Carnivores eat meat and have canines to tear and rip and a few molars to grind • The mouth begins the process using the teeth, saliva and tongue; • The oesophagus joins the mouth and stomach • The stomach can hold 1.5 litres and has strong acids and enzymes inside. It is on the left-hand side under your chest • The small intestine is about 7m long. It is located around the belly button • The large intestine is about 1.5m long. It contains the colon and rectum. It goes around the outside of the small intestine. • The mouth breaks up the food, saliva starts to digest the food and the tongue pushes the food
Ask relevant questions	Set up simple, practical enquiries and comparative and fair tests	Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	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, bar charts and tables	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	Identify differences, similarities or changes related to simple, scientific ideas and processes												

			<p>towards the oesophagus. A bolus is a ball of crushed up food which you swallow.</p> <ul style="list-style-type: none"> • The oesophagus is a muscular tube which pushes food down to the stomach • The peristalsis are wave like contractions which move the food through the oesophagus, small and large intestines • The stomach has muscles which churn food with acids and enzymes; this turns the food into a liquidy mixture • The small intestine is where digestible food is absorbed into the bloodstream • In the large intestine the colon removes water from the food and food that cannot be digested leaves the body via the rectum using strong muscles as faeces • Defecation is when we pass waste from our bodies as faeces • Digestion means to carry • a food chain shows the relationship between living things and is a path of energy • The arrows show the direction of the movement of the food energy • A predator hunts naturally, kills and eats other living things • Prey is an animal which is hunted, killed and eaten by another animal • Prey can also be the predator of other animals • A producer is a plant and this always starts the food chain this is eaten by animals. The plant makes its own food. • Consumers are animals who eat other animals and/or plants
<p>Curriculum Narrative</p> <p>Previous Learning</p>		<p>Tier 2 Vocabulary</p>	<p>Tier 3 Vocabulary</p>

	<p>Year 1 Animals, including humans animals, senses, body parts</p>	<p>Year 2 Animals, including humans offspring, basic needs, exercise</p>	<p>Year 3 Animals, including humans nutrition, skeleton</p>	<p>expel compact digestion acid stomach intestines</p>	<p>incisor canine molar enzyme saliva peristalsis</p>
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Year 4

Substantive Concepts:		PHYSICS – Electricity								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
<p>Year 4 Summer Term</p> <p>4.4 – What makes an electrical circuit?</p>	<ul style="list-style-type: none"> • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors. 	 Ask relevant questions	 Set up simple, practical enquiries and comparative and fair tests	 Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	 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, bar charts and tables	 Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	 Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	 Identify differences, similarities or changes related to simple, scientific ideas and processes	<p>Pupils should know that:</p> <ul style="list-style-type: none"> • mains electricity is supplied to a building by wires • mains electricity powers things that are plugged into a socket using a plug • appliances that need mains electricity need more power than battery-operated objects • batteries are a portable source of stored energy • we must be safe with electricity • simple series circuits are made up of components • a switch can make a circuit open or close • if components are changed in a circuit, this will have an effect on the brightness of the bulb • materials that allow electricity to pass through are conductors and materials that block electricity are called insulators









Curriculum Narrative Previous Learning	<p>Year 3 Light reflection, sources and shadows</p>	 <p>Year 3 Forces and magnets forces attract and repel</p>	<p>Year 4 Sound source, vibrations, pitch and volume</p>	Tier 2 Vocabulary	Tier 3 Vocabulary
				associate identify portable effect appliance series	component electrical insulator electrical conductor circuit hypothesis variable

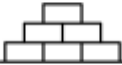
Year 4

Substantive Concepts:		PHYSICS – Sound								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
Year 4 Summer Term 4.5 – What is sound?	<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. 									<p>Pupils should know that:</p> <ul style="list-style-type: none"> sound is a very quick vibration and travels in waves sound can only travel through a medium such as solid, liquid or gas sound travels through anything with particles you can hear sound and can see/feel the vibrations sound is drawn as a sine wave sound gets fainter as the sound energy spreads out while it travels sound travels at 340 metres per second pitch is how high or low a sound is and is measured in Hertz (Hz) the size, length and tightness of the things vibrating will affect the pitch volume is the loudness or quietness of a sound two things that affect loudness are the amount of energy and the amount of matter vibrating
Curriculum Narrative Previous Learning	<p>Year 3 Light</p>	<p>Year 4 States of matter Electricity</p>						Tier 2 Vocabulary	Tier 3 Vocabulary	
								produce property source frequent regular affect	vibrate pitch volume medium vacuum sound wave	

Year 5









CHEMISTRY – Properties and Changes of Materials

Substantive Concepts:		CHEMISTRY – Properties and Changes of Materials								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist								End Point Knowledge
<p>Year 5 Autumn Term</p> <p>5.1 - Is this change reversible?</p>	<ul style="list-style-type: none"> 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 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 particular uses of everyday materials, including 									<p>Pupils should know that:</p> <ul style="list-style-type: none"> materials are made from atoms and molecules; an atom is the smallest known part of any material; a molecule is two or more atoms joined by a bond; particles can be atoms and molecules. materials can be magnetic (attracted by the force of magnetism); conductors (allow heat and electricity to travel through them); insulators (do not allow heat and electricity through); transparent (see through); opaque (can't be seen through); translucent (can see through slightly); soluble (can be dissolved). materials have properties that make them good insulators/conductors etc. solutions are liquids that have a material dissolved in them; mixtures are two or more materials mixed together; solutes are the dissolved materials in a liquid; solvents are the liquid. dissolving is when a solid, liquid or gas breaks down into tiny particles and mixes with the liquid, so they can't be seen. materials can be separated based on their properties (e.g. magnetic, soluble) through filtering, sieving and evaporation. reversible changes are those where the original state of the materials can be returned to, such as physical changes (melting ice); irreversible changes cannot be undone, such as chemical changes (burning, cooking).
		<p>Plan enquiries, including recognising and controlling variables where necessary</p>	<p>Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work</p>	<p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision</p>	<p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models</p>	<p>Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions</p>	<p>Present findings in written form, displays and other presentations</p>	<p>Use test results to make predictions to set up further comparative and fair tests</p>	<p>Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments</p>	

	<p>metals, wood and plastic</p> <ul style="list-style-type: none"> • demonstrate that dissolving, mixing and changes of state are reversible changes • 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>Curriculum Narrative</p> <p>Previous Learning</p>	<p>Science / Geography Y4 Water cycle</p> <p>Science Y4 Electricity </p> <p>Science Y4 States of matter</p> <p>Science Y5 Earth and space</p>		<p>Tier 2 Vocabulary</p>	<p>Tier 3 Vocabulary</p>
		<p>property particle separate combine recover comparative</p>	<p>atom molecule chemical changes physical changes reversible reaction</p>	

Year 5

BIOLOGY – Animals, Including Humans









Substantive Concepts:		BIOLOGY – Animals, Including Humans									
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist								End Point Knowledge	
<p>Year 5 Autumn Term</p> <p>5.2 – How do we change as we grow older?</p>	<ul style="list-style-type: none"> Describe the changes as humans develop to old age. Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans: by finding out and recording the length and mass of a baby as it grows. 	 Plan enquiries, including recognising and controlling variables where necessary	 Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work	 Take measurements, using a range of scientific equipment, with increasing accuracy and precision	 Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models	 Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions	 Present findings in written form, displays and other presentations	 Use test results to make predictions to set up further comparative and fair tests	 Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments	<p>Pupils should know that:</p> <ul style="list-style-type: none"> humans go through stages of development; they begin as fertilized eggs and then develop into embryos (0-7 weeks), before developing into a foetus (8/40 weeks); once they are born, these new-born babies become toddlers (1-3 years) then into young children (roughly 3-12 years old); children develop into adults during adolescence (roughly 13 - 19 years old) at which age they become physically capable of reproduction; as adults develop into old age (roughly 65+ years old) they experience changes in their body which require them to move more carefully and rest more frequently. adolescence means young man/woman; males and females go through puberty (girls at roughly 11 years old, boys 12-13, but this can range from 8-14 years); girls develop breasts, pubic hair and underarm hair; boys develop pubic and underarm hair; both get spots as skin changes. humans and animals have gestation periods; humans – 40 weeks, elephants – 95 weeks, however this doesn't mean a longer life expectancy (humans 79 years, elephants 60-70 years and butterflies about 2 weeks) 	
Curriculum Narrative										Tier 2 Vocabulary	Tier 3 Vocabulary
Previous Learning											

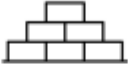
	<p style="text-align: center;">  Year 2 Animals, including humans notice that animals, including humans, have offspring which grow into adults </p>	<p style="text-align: center;"> Year 3 Animals, including humans skeletons for growth and support </p>	<p> development diverse unique generation mature equipped </p> <p> adolescence puberty gestation embryo foetus womb </p>
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Year 5

Substantive Concepts:		PHYSICS – Forces							
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge	
Year 5 Spring Term	5.3 – How do forces affect the movement of objects?	<div style="display: flex; justify-content: space-around; text-align: center;"> <div style="width: 10%;"></div> <div style="width: 10%;"></div> <div style="width: 10%;"></div> <div style="width: 10%;"></div> <div style="width: 10%;"></div> <div style="width: 10%;"></div> <div style="width: 10%;"></div> <div style="width: 10%;"></div> </div>						Pupils should know that:	
Curriculum Narrative	Previous Learning	Science Y3 Forces	Science Y4 Electricity States of matter Sound	Science Y5 Earth and space	Science Y5 Properties and changes of materials	Tier 2 Vocabulary	Tier 3 Vocabulary	<ul style="list-style-type: none"> friction is a force that always opposes the direction of an object’s movement; it can be helpful in brakes, anti-slip surfaces, tyre tread; it can be unhelpful when bike chains stick making it harder to cycle. air resistance is a type of friction that opposes the movement of an object through the air; it can be affected by the object’s surface area and speed. water resistance is a force that opposes an object’s movement through water; upthrust acts upwards on objects in water; the shape of the object changes the amount of water it displaces (larger surface area = more upthrust). 	
						opposite reaction advantage displace weight mass	pulley gear pivot fulcrum level upthrust		









Year 5

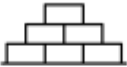
Substantive Concepts:		PHYSICS – Earth and Space								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
<p>Year 5 Spring Term</p> <p>5.4 – How is our solar system organised?</p>	<ul style="list-style-type: none"> 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 use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky. 	 Plan enquiries, including recognising and controlling variables where necessary	 Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work	 Take measurements, using a range of scientific equipment, with increasing accuracy and precision	 Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models	 Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions	 Present findings in written form, displays and other presentations	 Use test results to make predictions to set up further comparative and fair tests	 Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments	<p>Pupils should know that:</p> <ul style="list-style-type: none"> there are eight major planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune Mercury, Venus, Earth and Mars are rocky planets and Jupiter, Neptune, Saturn and Uranus are ‘gas giants’; Pluto is a dwarf planet. all planets orbit the Sun and the further they are from the Sun, the longer the orbit; each one spins on an axis; planets are known as approximately spherical bodies; Earth’s orbit takes 365 ¼ days; Pluto takes around 250 years to orbit the Sun. the moon doesn’t change shape, but our view of it changes as it orbits the Earth; its stages are: new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, third quarter and waning crescent; its orbit of Earth lasts 28 days. the Earth turns one full rotation (anti-clockwise) in 24 hours, resulting in night and day; sunrise is when our place on Earth begins to face the Sun; midday is facing the Sun directly at its highest point in the sky; sunset is when our place on Earth begins to turn away; night is when we are facing away from the Sun. the tilt of the Earth leads to the seasons: tilted towards the Sun means the Sun is higher in sky (Spring and Summer); tilted away from the Sun means the Sun is lower in the sky (Autumn and Winter).

Curriculum Narrative Previous Learning	Year 3 Stone Age – Iron Age	 Year 4 Light	Year 5 Maya civilisation	Tier 2 Vocabulary	Tier 3 Vocabulary
				luminous phenomenon attraction approximately relative apparent	orbit axis crescent gravitational waxing waning

Year 5

BIOLOGY – Living Things and Their Habitats

Substantive Concepts:		BIOLOGY – Living Things and Their Habitats								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
<p>Year 5 Summer Term</p> <p>5.5 – How do the life cycles of animals differ?</p>	<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. 	 Ask relevant questions	 Set up simple, practical enquiries and comparative and fair tests	 Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	 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, bar charts and tables	 Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	 Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	 Identify differences, similarities or changes related to simple, scientific ideas and processes	<p>Pupils should know that:</p> <ul style="list-style-type: none"> the life cycle of a living thing is a series of stages of development in its life. generally, mammals are vertebrates; develop as an embryo in the mother’s womb; give birth to live young; reproduce through sexual reproduction; feed babies with the mother’s milk; grow larger when young; adolescents mature into adults. amphibians are vertebrates; reproduce sexually; lay eggs, that contain embryos, in water; are once larvae (called tadpoles) that hatch with gills; physically change as they mature (called metamorphosis); grow legs and lungs and the young become adults. insects are invertebrates; reproduce sexually; lay eggs that later hatch into larvae; the larvae then feed and grow, before transforming into a pupa - they undergo a biochemical change in which the larval body breaks down and reforms as an adult (metamorphosis). birds are vertebrates; reproduce sexually; lay eggs that are kept warm in a nest; the embryo grows inside the fertilised egg; however, unfertilised eggs don’t produce chicks; young chicks grow more feathers and mature into adults. over 300 years ago, Maria Merion’s work around entomology (the study of insects) helped to change beliefs about how insects were formed; she made detailed notes and diagrams from her observations to do this; she is known as an important contributor to entomology.

			<ul style="list-style-type: none"> • reproduction means to make a copy and is necessary for species to survive • sexual reproduction (most plants and animals) is between a male and female and combines their cells; produces variation in the species that can help with survival. • asexual reproduction is to make an identical copy of the parent is much rarer in animals (Komodo dragons, jellyfish, some sharks and snakes); it is an efficient way to populate in plants. • flowering plants sexually reproduce through pollination (combining the male pollen and female ovule); seeds are produced that germinate and grow into a seedling. • - some plants reproduce asexually (make an identical copy): those with tubers e.g. potatoes, runners, called stolon (above ground), rhizomes (extended roots) and bulbs (below ground). 		
Curriculum Narrative Previous Learning	<p>Year 4 Living things and their habitats</p>	 <p>Year 4 Animals, including humans</p>	<p>Year 4 Plants</p>	Tier 2 Vocabulary	Tier 3 Vocabulary
				deduce process re-form transform adolescence contract	Embryo sexual reproduction metamorphosis incubate biochemical fertilisation

Year 5

Substantive Concepts:		PHYSICS – Forces								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
Year 5 Summer Term 5.6 – How do forces help us?	<ul style="list-style-type: none"> recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 									<p>Pupils should know that:</p> <ul style="list-style-type: none"> levers all have a load (the force applied); an arm or rod and a fulcrum, or pivot, that the arm moves around. pulleys are mechanisms that help to move heavy things and have a grooved wheel, an axle and rope. gears are rotating wheels with teeth that interlock to turn each other: there is always a driver gear and a follower gear; they use a small force to have a greater effect. Galileo Galilei was an Italian astronomer and physicist who studied the science of motion; he improved the telescope; he discovered the weight of an object doesn't affect how fast it falls; he studied the moons of Jupiter and their movement around Jupiter, supporting Copernicus' theory of the heliocentric model.
Curriculum Narrative Previous Learning	Science Y3 Forces	Science Y4 Electricity States of matter Sound	Science Y5 Earth and space	Science Y5 Properties and changes of materials					Tier 2 Vocabulary	Tier 3 Vocabulary
								opposite reaction advantage displace weight mass	pulley gear pivot fulcrum level upthrust	

Year 6

Substantive Concepts: BIOLOGY – Living Things and Their Habitats









Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist	End Point Knowledge
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<p>Year 6 Autumn Term</p> <p>6.1 – How can animals be classified?</p>	<ul style="list-style-type: none"> describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals give reasons for classifying plants and animals based on specific characteristics 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="font-size: small;">Ask relevant questions</td> <td style="font-size: small;">Set up simple, practical enquiries and comparative and fair tests</td> <td style="font-size: small;">Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers</td> <td style="font-size: small;">Gather, record, classify and present data in a variety of ways to help in answering questions</td> <td style="font-size: small;">Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables</td> <td style="font-size: small;">Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</td> <td style="font-size: small;">Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests</td> <td style="font-size: small;">Identify differences, similarities or changes related to simple, scientific ideas and processes</td> </tr> </table>									Ask relevant questions	Set up simple, practical enquiries and comparative and fair tests	Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	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, bar charts and tables	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	Identify differences, similarities or changes related to simple, scientific ideas and processes	<p>Pupils should know that:</p> <ul style="list-style-type: none"> Carl Linnaeus was a Swedish naturalist who created the taxonomy systems to organise all living things; living things are organised by Kingdoms (Animals, Plants, Fungi, Bacteria, Algae), Phylum (Vertebrate, Mollusc, Arthropod), Class (mammals, reptiles, fish). vertebrates are grouped into 5 classes: amphibians, birds, fish, mammals and reptiles. invertebrates (approx.. 95% of animal species) are grouped into 7 classes: sponges, flatworms, jellyfish, arthropods (crustacean, arachnida, insects, myriapods), annelida, Echinodermata and molluscs arthropod is an invertebrate with a hard , external skeleton and jointed limbs insects are a type of arthropod; their bodies consist of six legs, a head, a thorax and an abdomen; most insects also have a pair of antennae and a pair of wings an arachnid (e.g. spider) is a type of arthropod with eight legs and no antennae or wings a crustacean is a type of arthropod with two pairs of antennae (e.g. woodlouse) a myriapod is an arthropod with a flat and long or cylindrical body and many legs (e.g. centipede)
Ask relevant questions	Set up simple, practical enquiries and comparative and fair tests	Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	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, bar charts and tables	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	Identify differences, similarities or changes related to simple, scientific ideas and processes												

Curriculum Narrative			Tier 2 Vocabulary	Tier 3 Vocabulary
Previous Learning				









	<p>Year 4 Living things and their habitats</p>	 <p>Year 5 Living things and their habitats</p>	<p>Year 5 Animals, including humans</p>	<p>characteristic interdependence specific categorise primitive hierarchy</p>	<p>fungus arthropod taxonomy kingdom phylum genus</p>
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Year 6

Substantive Concepts:		PHYSICS – Light								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
<p>Year 6 Autumn Term</p> <p>6.2 – How does light travel?</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. 	 <p>Plan enquiries, including recognising and controlling variables where necessary</p>	 <p>Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work</p>	 <p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision</p>	 <p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models</p>	 <p>Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions</p>	 <p>Present findings in written form, displays and other presentations</p>	 <p>Use test results to make predictions to set up further comparative and fair tests</p>	 <p>Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments</p>	<p>Pupils should know that:</p> <ul style="list-style-type: none"> • translucent objects allow some light to pass through, but some of the light changes direction as it passes through the object; this means that an something seen through a translucent object is not clearly defined • when light passes from one medium to another (e.g. from air to water), it changes direction; this is called refraction; this happens because light travels at different speeds in different media. • white light comprises all the colours of light • white light refracted by two surfaces in a prism will spread out so that all of its constituent colours can be seen; this array of colours is called a spectrum; it happens because the different colours of that constitute white light travel at different speeds. • how to draw a diagram to show why the shape of a shadow will match the shape of an object • when light reflects off an object, the angle of incidence is equal to the angle of reflection • a periscope takes advantage of the predictable angles of incidence and reflection to allow an image to be shown to a viewer
<p>Curriculum Narrative</p> <p>Previous Learning</p>	<p>Science Y4 Electricity</p>	<p>Science Y4 Sound and States of Matter</p>	<p>Science Y4 Earth and space</p>	<p>Science Y5 Properties and change in materials</p>	<p>Tier 2 Vocabulary</p>	<p>Tier 3 Vocabulary</p>				

		impurity emit absorb constituent filter artificial	refraction incidence spectrum prism lux pigment
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Year 6

Substantive Concepts:		BIOLOGY – Animals, Including Humans								
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge		
<p>Year 6 Spring Term</p> <p>6.3 – What is the circulatory system and how does it work?</p>	<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. 	 <p>Plan enquiries, including recognising and controlling variables where necessary</p>	 <p>Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work</p>	 <p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision</p>	 <p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models</p>	 <p>Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions</p>	 <p>Present findings in written form, displays and other presentations</p>	 <p>Use test results to make predictions to set up further comparative and fair tests</p>	 <p>Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments</p>	<p>Pupils should know that:</p> <ul style="list-style-type: none"> the blood carries nutrients (such as oxygen and water) around the body and helps to remove waste products from the body. the blood is made of red blood cells, plasma, platelets and white blood cells; be able to describe each component’s purpose and their relative proportions. cells in our body need nutrients to grow and multiply; nutrients are passed through cell walls and used in the process of respiration to create energy. there are important nutrient groups that our body needs in order to grow and be healthy; know the purpose of each nutrient group. the main parts of the circulatory system are: heart, lungs, arteries, veins and capillaries; know the purpose of each part. blood travels around the body (heart -> lungs -> heart -> body). the heart beats (acting as a double pump) to move oxygenated blood to the body and deoxygenated blood to the lungs. arteries carry oxygenated blood to the body away from the heart; veins carry deoxygenated blood to the heart; capillaries are tiny blood vessels that connect arteries and veins. the heart is composed of four chambers: two atria and two ventricles; the aorta is the largest artery in the body and most major arteries branch off from that. the right side of the heart receives deoxygenated blood from the body and sends it

					<p>to the lungs; the left side receives oxygenated blood from the lungs pumps.</p> <ul style="list-style-type: none"> the work of Galen and William Harvey influenced our knowledge and understanding of the circulatory system and that these theories changed over time. they can lead a healthy life through exercise and the consumption of water and a healthy, balanced diet; know the effects of being healthy. - when we exercise, our heart beats more frequently so that the oxygen that is used around the body can be replenished; it returns to a resting heart rate afterwards; fitter people tend to have lower resting heart rates.
Curriculum Narrative Previous Learning	Year 3 Animal, including humans nutrition, skeletons and muscles	Year 4 Animal, including humans teeth, digestion and food chains	Year 5 Animal, including humans changes as humans develop to old age	Tier 2 Vocabulary	Tier 3 Vocabulary
				cell chamber system circulation vessel clot	plasma platelet artery capillary vain ventricle

Year 6

Substantive Concepts: BIOLOGY – Animals, Including Humans

Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist	End Point Knowledge
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<p>Year 6 Spring Term</p> <p>6.4 – How do our kidneys keep us healthy?</p>	<ul style="list-style-type: none"> Describe the ways in which nutrients and water are transported within animals, including humans. 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> <td style="width: 12.5%; text-align: center;"></td> </tr> <tr> <td style="font-size: small;">Plan enquiries, including recognising and controlling variables where necessary</td> <td style="font-size: small;">Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work</td> <td style="font-size: small;">Take measurements, using a range of scientific equipment, with increasing accuracy and precision</td> <td style="font-size: small;">Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models</td> <td style="font-size: small;">Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions</td> <td style="font-size: small;">Present findings in written form, displays and other presentations</td> <td style="font-size: small;">Use test results to make predictions to set up further comparative and fair tests</td> <td style="font-size: small;">Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments</td> </tr> </table>									Plan enquiries, including recognising and controlling variables where necessary	Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work	Take measurements, using a range of scientific equipment, with increasing accuracy and precision	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models	Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions	Present findings in written form, displays and other presentations	Use test results to make predictions to set up further comparative and fair tests	Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments	<p>Pupils should know that:</p> <ul style="list-style-type: none"> the digestive system includes the mouth, teeth, tongue, oesophagus, stomach, intestines and the rectum; helps us to break down nutrients and water and absorb them into the bloodstream. the circulatory system includes the heart, arteries, veins, capillaries, lungs and blood; blood moves important nutrients and waste products around the body. the kidneys are found either side of the vertebrae; blood enters the kidneys and waste products (toxins) are filtered out, cleaning the blood (around 180 litres a day); waste products are dissolved in water, creating urine; kidneys adjust the amount of water they excrete due to the body's water levels (urinate less when dehydrated). darker urine means you are dehydrated (not enough water to function optimally); signs of dehydration are headaches, thirst, dry mouth.
Plan enquiries, including recognising and controlling variables where necessary	Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work	Take measurements, using a range of scientific equipment, with increasing accuracy and precision	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models	Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions	Present findings in written form, displays and other presentations	Use test results to make predictions to set up further comparative and fair tests	Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments												


<p>Curriculum Narrative</p> <p>Previous Learning</p>	<p>Year 3 Animal, including humans nutrition, skeletons and muscles</p> <p>Year 4 Animal, including humans teeth, digestion and food chains</p>	<p>Year 5 Animal, including humans changes as humans develop to old age</p>	<p>Year 6 Animal, including humans circularity system</p>	<p>Tier 2 Vocabulary</p> <p>filter exoeel substance function regulate transform</p>	<p>Tier 3 Vocabulary</p> <p>kidney bladder urine excretion toxin nutrient</p>
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Year 6

Substantive Concepts:









PHYSICS – Electricity

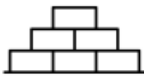
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist								End Point Knowledge
<p>Year 6 Summer Term</p> <p>6.5 – How do the number of electrical components in a circuit affect how it works?</p>	<ul style="list-style-type: none"> associate the brightness 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 use recognised symbols when representing a simple circuit in a diagram. 	 Plan enquiries, including recognising and controlling variables where necessary	 Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work	 Take measurements, using a range of scientific equipment, with increasing accuracy and precision	 Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models	 Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions	 Present findings in written form, displays and other presentations	 Use test results to make predictions to set up further comparative and fair tests	 Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments	<p>Pupils should know that:</p> <ul style="list-style-type: none"> atoms are the smallest part of matter and are made of protons and neutrons (the nucleus) and electrons; protons are positively charged; neutrons are negatively charged. voltage (measured in volts) is the push given to move electrons around a circuit; the size of a battery doesn't affect the power it has. current is the flow of electricity measured in amps. electricity travels in one direction, leaving the battery from the positive side and returning through the negative; electrical charge is made by generating electrons. simple series circuits are simple loops with a battery and other components; the number of cells affects the brightness of a bulb. each part of a circuit has a symbol; switches can be shown as closed or open in a circuit diagram. as the number and voltage of cells in a circuit increases, the brightness of a bulb or the volume of a buzzer will increase (though too high a voltage may 'blow' the bulb or buzzer) they can predict whether components will function in a given circuit, depending on whether or not the circuit is complete; whether or not a switch is in an on or off position; and whether or not there is a cell to provide electrical current to the circuit. two bulbs in a circuit can be wired up to create a series circuit or a parallel circuit; if one bulb blows in a series circuit the other will not shine as the circuit has been broken; in contrast, if one bulb blows in a parallel circuit, there will

			<p>still be a complete circuit for the other bulb so it will continue to shine; use this knowledge to explain the advantages of using parallel circuits (e.g. in the lighting in homes)</p> <ul style="list-style-type: none"> - it is dangerous to play with plugs/leave liquid near electrical items/touch exposed wires/touch switches with wet hands/fly kites near overhead power lines. 			
Curriculum Narrative Previous Learning	<p>Year 3 Light reflection, sources and shadows</p>	 <p>Year 3 Forces and magnets forces attract and repel</p>	<p>Year 4 Sound source, vibrations, pitch and volume</p>	<p>Year 4 Electricity series circuits and elements</p>	<p>Tier 2 Vocabulary</p>	<p>Tier 3 Vocabulary</p>
					<p>component consequence systematic represent source generate</p>	<p>proton neutron electron terminal series voltage</p>

Year 6

BIOLOGY – Evolution and Inheritance

Substantive Concepts:		BIOLOGY – Evolution and Inheritance																
Term and Focus	NC objectives Pupils should be taught about:	Disciplinary Knowledge: Thinking as a Scientist						End Point Knowledge										
<p>Year 6 Summer Term</p> <p>6.6 – How has life evolved?</p>	<ul style="list-style-type: none"> recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago 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. 									<p>Plan enquiries, including recognising and controlling variables where necessary</p>	<p>Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work</p>	<p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision</p>	<p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models</p>	<p>Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions</p>	<p>Present findings in written form, displays and other presentations</p>	<p>Use test results to make predictions to set up further comparative and fair tests</p>	<p>Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments</p>	<p>Pupils should know that:</p> <ul style="list-style-type: none"> fossils are the remains of living things that died a long time ago; the fossil record can show how living things have changed over time; some fossil records have gaps as they haven't all been found, or due to decomposition. there are different types of fossil: body, mould, cast and trace and identify them. all life on Earth began from a single point around 3.6 billion years ago. living things have evolved over time and this gradual change is called evolution. DNA is a molecule in a cell that carries genes, which hold genetic information; genes determine inheritable characteristics such as eye and hair colour; acquired characteristics are as a result of environmental impacts, not DNA. living things reproduce in different ways to produce offspring (sexual/asexual); offspring are not identical in sexual reproduction (variation). Charles Darwin posited the theory of evolution by natural selection (natural variation within a species); discovered humans had a common ancestor; Alfred Wallace found a similar conclusion and supported Darwin's theory. natural selection is due to living things having desirable characteristics, that favour survival, being passed on to offspring. living things have evolved to develop adaptive traits that are advantages or disadvantages; 'survival of the fittest' is when living things survive due to their useful inherited characteristics which are passed to their offspring; members of a species with less

			advantageous characteristics do not survive and reproduce – these characteristics are not passed down to offspring.		
Curriculum Narrative Previous Learning	<p>Science Y5 Life cycles and reproduction</p>	<p>Science Y3 Rocks</p>	<p>Geography Y4 Water cycle</p>	Tier 2 Vocabulary	
		<p>Science Y5 Animals, including humans</p>	 <p>Science Y5 Properties and changes of materials</p>	Science Y6 Classification	Tier 3 Vocabulary
				<p>characteristic adaptation acquire theory modify generation</p>	<p>evolve survival species clone inherit fossil</p>