



**Science Curriculum Intent
Progression of Skills and Knowledge**

Our Vision for Science

In Science, we aim to foster children's natural curiosity about the world around them, encouraging them to be inquisitive, independent and active in their learning. We aim to provide as many opportunities to explore and investigate as possible, to develop a sense of wonder and a caring and responsible attitude towards the natural world. Our aim is to make 'learning stick' by providing opportunities for children to revisit key concepts and scientific vocabulary in their learning at every opportunity.

Spirituality Statement

Psalm 96: 11-12

*Let the heavens be glad, and let the earth rejoice;
let the sea roar, and all that fills it;
let the field exult, and everything in it!
Then shall all the trees of the forest sing for joy*

Cultural Capital

(Experiences that every child should have)

- Observing a range of plants and animals first-hand, in the local environment, parks, garden centres, zoos and other animal centres
- Growing their own fruits and vegetables all the way through from seed to the plate
- Be surprised by what happens and excited about what they discover when working practically
- Make discoveries through trial and error - and not being afraid to get things wrong
- Ask 'big questions' about life and our world.

Cross Curricular Links

- Use of ICT to collect data, analyse results and
- Present findings
- History - the lives and impact of famous scientists
- from the past
- Geography - animal habitats from around the world,
- Weather systems, rock formation
- Maths - Data handling
- English - posing and writing questions, presenting
- Findings both verbally and through written

	<ul style="list-style-type: none"> • observations and conclusions • Art - using plants and animals in the local and wider • Environment as a starting point for art • DT building structures using a variety of materials, • selected for their properties and effectiveness. 		
<p>Composite objectives in Science in the Early Years Foundation Stage (Reception)</p> <p>Understanding of the world</p> <ul style="list-style-type: none"> • Express views and answer why questions about why things happen. • Make observations of animals and plants and explain why some things occur and talk about changes. • Looks closely at similarities, differences, patterns and change • Solve real problems • Sort materials • Realise that their actions influence the world, so they want to keep repeating them. • Plan and think ahead about how they will explore or play with objects. 	<p>Composite objectives for working scientifically for KS1 are taken from the National Curriculum 2014 and they are;</p> <ul style="list-style-type: none"> • 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. 		
	Rec	Year 1	Year 2
<p>Working Scientifically - Ideas, questions and planning</p>	<p>Be curious and ask questions. Use simple equipment eg magnifying glasses.</p>	<p>Ask simple questions and begin to recognise that they can be answered in different ways. Perform simple tests following the teacher's instructions. Use simple measurements and equipment eg tape measure, measuring cylinder.</p>	<p>Ask simple questions and begin to recognise that they can be answered in different ways. With guidance, suggest what they will do to find something out. With guidance, identify what they will observe or measure. Use resources provided or selected from a limited range. Perform simple tests following the teacher's instructions. Use simple measurements and equipment eg tape measure, measuring cylinder.</p>
<p>Working Scientifically – Observing and Presenting evidence</p>	<p>Use their senses to observe objects. Look closely at objects and notice changes.</p>	<p>Observe closely (including over time) using simple equipment eg magnifying glasses, bug capture pots. Gather and record simple data.</p>	<p>Observe closely (including over time) using simple equipment eg magnifying glasses, bug capture pots. Gather and record simple data. Make measurements using non-standard units eg cubes, hands.</p>

			With support, talk about their findings using everyday language, text scaffolds or simple scientific language. Use simple secondary sources eg books, video clips, photos, people to find answers.
Working Scientifically- Considering and evaluating evidence	Sort and match a range of objects in own ways eg by colour or size. Notice similarities and differences. Talk about what they have done, seen or noticed	Decide how to sort and classify objects. Use their observations to suggest answers to simple questions eg I think that this material is the most waterproof because I saw all the water drip off.	Decide how to sort and group objects. Use their observations to suggest answers to simple questions eg I think that this material is the most absorbent because I noticed that there was less water left. Compare objects, materials and living things by using simple observable features eg size, colour, texture. Talk about what they have found out and how they found it out.
Animals including humans	The composite objectives for this unit are; <ul style="list-style-type: none"> • Make observations of animals and plants and explain why some things occur and talk about changes. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. 	The composite objectives for this unit are; <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) 	The composite objectives for this unit are; <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.
	Can name and locate on themselves some basic parts	Name and locate basic parts of human body. Draw and label a simple body outline of a human.	Make comparisons between humans at different ages eg between babies and toddlers.

	<p>of human body eg arm, leg, facial features.</p> <p>Know the name of some common animals eg farm animals, dog, bird, ladybird, butterfly.</p> <p>Know the names of the offspring of some common animals eg puppy, kitten, foal, calf, chick.</p> <p>Comment and ask questions about aspects of the natural world eg “look at the spots on the ladybird”.</p> <p>Show care and concern for the wellbeing of animals in their environment.</p>	<p>Name the five senses and the body parts associated with them.</p> <p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals and invertebrates.</p> <p>Describe and compare the structure of a variety of common animals inc fish, amphibians, reptiles, birds and mammals, invertebrates.</p> <p>Identify and name a variety of common animals that are carnivore, herbivore and omnivore.</p>	<p>Find out about and describe the basic needs of animals, inc humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating healthy foods, personal hygiene.</p> <p>Identify some types of food that make up a good diet and name some examples of each.</p>
	<p>Key Vocabulary body, eyes, nose, mouth, ears, head, arms, legs, knees, animals, baby</p>	<p>Key Vocabulary sight, hearing, touch, taste, smell, amphibians, birds, fish, mammals, reptiles, carnivore, herbivore, omnivore,</p>	<p>Key Vocabulary adult, develop, life cycle, offspring, reproduce, young, dehydrate, diet, disease, energy, exercise, germs, heart rate, hygiene, nutrition, pulse</p>
<p>Uses of Everyday materials</p>	<p>The composite objectives for this unit are;</p> <ul style="list-style-type: none"> • Explore collections of materials with similar and/or different properties. • Explore and talk about different forces they can feel. • Talk about the differences between 	<p>The composite objectives for this unit are;</p> <ul style="list-style-type: none"> • Distinguish between an object and the material 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. 	<p>The composite objectives for this unit are;</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

	<p>materials and changes they notice.</p> <ul style="list-style-type: none"> Explore different materials, using all their senses to investigate them. Manipulate and play with different materials. Use their imagination as they consider what they can do with different materials. Make simple models which express their ideas. 		
	<p>Talk about how objects feel or behave eg. “this can bend” or “this feels rough when you touch it”.</p>	<p>Distinguish between an object and the material from which it is made. Identify and name a range of everyday materials eg wood, plastic, glass, metal, rock, water. Describe the simple physical properties of these materials. Compare and group a set of materials according to their properties eg bendy v non bendy, hard v soft.</p>	<p>Describe the properties of a range of materials. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Understand that we choose different materials for different purposes. Suggest reasons why a material is suitable for a particular purpose. Find out how the shape of solid objects can be changed by squashing, bending, twisting and stretching.</p>
	<p>Key Vocabulary rough, smooth, bendy, hard, fluffy, wood, metal, glass, card, paper</p>	<p>Key Vocabulary object, material, hard, soft, stretchy, shiny, dull, rough, smooth, bendy, not bendy, waterproof, not waterproof, absorbent, not absorbent, transparent, opaque</p>	<p>Key Vocabulary materials, suitability, properties</p>
Plants	<p>The composite objectives for this unit are;</p> <ul style="list-style-type: none"> Make observations of animals and plants and explain why some things 	<p>The composite objectives for this unit are;</p> <ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants including deciduous and evergreen trees 	<p>The composite objectives for this unit are;</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

	<p>occur and talk about changes.</p> <ul style="list-style-type: none"> Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. 	<ul style="list-style-type: none"> Identify and describe the basic structure of a variety of common flowering plants including trees 	
	<p>Make simple observations of plants including flowers or vegetables in their familiar environment eg colour, size, shape, how they grow.</p> <p>Notice some similarities and differences between different plants.</p> <p>Begin to notice that plants grow, change and decay over the seasons.</p>	<p>Name some plants in their local environment using simple identification guides eg photos.</p> <p>Identify and name a variety of common wild and garden plants inc deciduous and evergreen trees.</p> <p>Identify and describe the basic structure of a variety of common plants inc trees.</p> <p>Grow plants from seeds and notice changes as they grow.</p> <p>Know that plants need water and sunlight to grow well.</p> <p>Understand that plants have a life cycle.</p>	<p>Know what 'germination' means and suggest how to find out what seeds need in order to germinate successfully.</p> <p>Explore how plants grow from seeds and bulbs.</p> <p>Describe what they observe as plants grow.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Know that humans and other animals eat plants as food.</p>
	<p>Key Vocabulary</p> <p>Plant, flower, vegetable, fruit, petal, leaf, stem, trunk, branch</p>	<p>Key Vocabulary</p> <p>wild plants, garden plants, weed, deciduous, evergreen, roots, stem, leaves, flowers, petals, fruit, seed, bulb</p>	<p>Key Vocabulary</p> <p>germination, sprout, shoot, seed dispersal, sunlight, water, temperature, nutrition</p>
Living Things and their Habitats			<p>The composite objectives for this unit are;</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

			<p>animals and plants and how they depend on each other.</p> <ul style="list-style-type: none"> • Identify and name a variety of plants and animals in their habitats including microhabitats. • Describe how animal obtain their food from plants and other animals using the idea of a simple food chain and identify and name different sources of food.
			<p>Identify and name a variety of plants and animals in their habitats including micro habitats.</p> <p>Identify that most living things live in habitats to which they are suited and describe how animals' habitats provide for the basic needs of different animals and plants and how they depend on each other.</p> <p>Explore and compare the differences between things that are living, dead and have never been alive.</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain and identify and name some sources of food.</p> <p>Understand that we should take care of our planet and the habitats in it.</p>
			<p>Key Vocabulary life processes, living, dead, never living, food chain, food sources, habitat, microhabitat, depend, survive</p>
Seasonal Changes	<p>The composite objectives for this unit are;</p> <ul style="list-style-type: none"> • Understand the effect of changing seasons on the natural world around them. • Explore the natural world around them. 	<p>The composite objectives for this unit are;</p> <ul style="list-style-type: none"> • Observe changes across the four seasons – Autumn / Winter / Spring / Summer. • Observe and describe weather associated with the seasons and how day length varies. 	

	<ul style="list-style-type: none"> Describe what they see, hear and feel whilst outside. 		
	<p>Talk about some seasonal changes as they happen when talking with an adult eg. leaves falling, animals having young, plants flowering.</p>	<p>Name the four seasons and know some of the months that fall in each eg December is in winter. Identify differences between the seasons from experience and in photographs. Identify what to observe when comparing the seasons eg temperature, rainfall. Observe changes across the seasons. Observe and describe weather associated with the seasons. Observe that day length changes. Explain why we wear different clothing according to the seasons.</p>	
	<p>Key Vocabulary weather, rain, clouds, sun, snow, wind, spring, summer, autumn, winter</p>	<p>Key Vocabulary seasons, spring, summer, autumn, winter, weather, daylight</p>	

Science Curriculum Implementation

We have decided to use the science scheme **Developing Experts** as it provides a library of over 700 interactive online science lessons with fun science experiments, handouts and assessment for learning activities, fully mapped against the Science National Curriculum for KS1, KS2 and KS3. The lessons have been designed with the help of global experts from industry and university, who have each shared their knowledge to help create the teaching resource and show links between STEM and the wider world.

How do we implement the science curriculum?

- Through clearly presented key concepts.
- Clear articulation of content and knowledge.
- Effective explanation and modelling.
- Tasks that enable pupils to meet the composite objectives.
- Shared teaching that enables pupils to acquire new learning and guided teaching that provides opportunities for pupils to practise new learning.
- Active learning that aids pupils' participation and engagement.
- Through careful planning and sequencing of components to meet composite objectives.
- Through group and paired discussions that aid understanding.
- The next lesson in a sequence is taught after assessment of the prior lesson to ensure that the cohort's needs are met.
- We use Robin Launder's, 'Making Learning Stick' strategies to help pupils embed key concepts in their long-term memory. We have a revisit session at the start of every D&T lesson to enable pupils to remember prior learning through interweaving and retrieval practise. Other strategies are used at different points within the lesson.
- New knowledge and skills are built on what has already been taught so that pupils can 'know more and remember more.'
- The D&T curriculum is taught remotely for pupils who are not able to attend school.
- Through effective questioning approaches and the use of 'Bloom's Taxonomy' to deliver higher order questioning to aid learners' understanding and progress
- A word aware approach to vocabulary acquisition.
- We adapt teaching at the point of learning to ensure the needs of learners are met and that they can continue to progress in sequence and deepen understanding.
- Dual coding – presenting concepts both verbally and visually to enhance retrieval from memory, including kinaesthetic and active approaches to engage.
- We complete enquiry-based lessons to allow children to have hands on experiences and apply their learning to the wider world.
- Through group and paired discussions that aid understanding.
- The next lesson in a sequence is taught after assessment of the prior lesson to ensure that the cohort's needs are met.
- We use Robin Launder's, 'Making learning stick' strategies to help pupils embed key concepts in their long-term memory so that they can apply them fluently. We do this at the beginning of every science lesson to enable pupils to remember prior learning through interweaving and retrieval practise..
- The science curriculum is taught remotely for pupils who are not able to attend school.
- We adapt teaching at the point of learning to ensure the needs of learners are met and that they can continue to progress in sequence.

How do we assess the science curriculum?

- Assessment in science takes place at the point of learning as part of formative assessment. Pupils are given direct feedback to aid immediate progress and address misconceptions.
- Assessment at the point of learning assists teachers to plan the next steps for the next day.
- Teachers identify a pupils' attainment by identifying their place within the progression of skills and where this fits in relation to the steppingstones between the expectations for a particular term and the milestones at the end of the term.