

Progression in Science / Maths

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>National curriculum objectives -</p> <p>Working scientifically</p> <p>Science</p>	<p>During Years 1 and 2 pupils should be taught to use the following practical scientific methods, processes and skills through teaching:</p> <ul style="list-style-type: none"> -Asking simple questions and recognising they can be answered in different ways (question walls to be used). -Observing closely, using simple equipment. -Performing simple tests. -Identifying and classifying. -Using their observations and ideas to suggest answers to questions. 	<p>During Years 3 and 4 pupils should be taught to use the following practical scientific methods, processes and skills through teaching:</p> <ul style="list-style-type: none"> -Asking relevant questions and using different types of scientific enquiry. -Setting up simple practical enquiries, comparative and fair tests. -Making careful and systematic observations and taking accurate measurements using standard units, using a range of equipment. - Gathering, recording, classifying and presenting data. -Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. -Reporting on findings from enquiries. -Using results to draw simple conclusions. -Identifying differences, similarities or changes related to simple scientific ideas and processes. -Using straightforward scientific evidence to answer questions. 	<p>During Years 5 and 6 pupils should be taught to use the following practical scientific methods, processes and skills through teaching:</p> <ul style="list-style-type: none"> -Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. -Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. -Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. -Using test results to make predictions. -Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms. -Identifying scientific evidence that has been used to support or refute ideas or arguments. 			

<p>Topics taught from National Curriculum</p> <p>Highlighting shows strong links between subjects - ensure these are shown on Knowledge Organisers (KO).</p>	<p>Plants</p> <p>Animals, including humans</p> <p>Everyday materials</p> <p>Seasonal change</p>	<p>Plants</p> <p>Animals, including humans</p> <p>Living things and habitats</p> <p>Uses of everyday materials</p>	<p>Plants</p> <p>Animals, including humans</p> <p>Rocks</p> <p>Light</p> <p>Forces and magnets</p>	<p>Animals, including humans</p> <p>Living things and habitats</p> <p>States of matter</p> <p>Sound</p> <p>Electricity</p>	<p>Animals, including humans</p> <p>Living things and habitats</p> <p>Properties and changes of materials</p> <p>Earth and Space</p> <p>Forces</p>	<p>Animals, including humans</p> <p>Living things and habitats</p> <p>Evolution and inheritance</p> <p>Light</p> <p>Electricity</p>
<p>Examples of scientific enquiry:</p> <p>Plants</p>	<p>Adopt a tree (link to plants and seasonal change).</p> <p>Grow plants: peas</p> <p>Name basic parts: Leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branch, stem.</p>	<p>Recap on basic plant parts - have on Knowledge Organiser from Year 1.</p> <p>Use the local environment to observe how plants/tree grow.</p> <p>Grow plants sunflowers and look at what plants need for survival: look</p>	<p>Have basic names and needs of a plant on Knowledge Organiser.</p> <p>Children to look at function of basic parts - food colouring traveling up the stem.</p> <p>To look at seed dispersal.</p>		<p>Plant life cycles to be studied through growing a bean and observing this at each stage. Children to be able to write about life cycles and compare to animals / humans.</p> <p>Fertilisation /germination of plants to be looked at in</p>	

	<p>Name basic plants: sunflower, tulip, daffodil, rose, daisy, dandelion.</p> <p>Use magnifying glasses to observe plants closely.</p>	<p>at the amount of water a plant needs-</p> <p>Set up a comparative test.</p> <p>Use microscopes to look at parts of plant.</p>	<p>Use microscopes to look at seeds / bulbs.</p> <p>Name more plants: Poppy, orchid, iris.</p>		<p>detail. Dissect a range of plants.</p> <p>Name more plants: chrysanthemums, hyacinths, bluebells, snowdrops.</p>	
Mathematical links	<p>Measurement - use bags to grow plants and use stickers to measure roots/stem. Non-standard forms of measuring.</p> <p>Counting plants - daisies / dandelions.</p>	<p>Capacity - looking at volume of water being given to plant.</p> <p>How long does it take for the sunflower to grow?</p>	<p>Seed dispersal - measurement of how far they travel. Measure time take to travel to the ground.</p> <p>Measure volume of water taken up by a plant.</p>		<p>Growing a bean - measurement of root and stem. Use cm and mm to measure accurately, following on from Year 1.</p>	
Curriculum links	<p>Children have opportunity to be in Gardening clubs, Gardening for Family PLZs and to observe plants during our OPAL provision.</p> <p>We look at how plants are used for nutrition in other year groups.</p> <p>School is part of RHS and has opportunities to do other plant related activities.</p> <p>Phunky Food ambassadors and Eco Club members look at healthy eating.</p>					
Careers / Important people	Gardener	Greenhouse manager	Crop consultant		Environmental scientist	

Links to stories	Ten Seeds by Ruth Brown	The Tiny Seed by Eric Carle	A Tree is a Plant by Clyde Robert Bulla			
Animals, including humans	<p>Identify and name a variety of common animals - know the words 'mammals', 'fish', 'amphibians', 'reptiles', 'birds'.</p> <p>Look at carnivores, herbivores and omnivores - classify these.</p> <p>Describe and compare structure of animals.</p> <p>Identify, name, draw, label basic parts of human body.</p> <p>Look at 5 senses and say which body</p>	<p>Recap on animal types on KO.</p> <p>Look at how animals have offspring which grow into adults. Compare different animals through timelines.</p> <p>Find out about basic needs for survival.</p> <p>Look at why humans need exercise / to eat food / hygiene. PSHE links. Discuss healthy eating eg. fruit and vegetables.</p>	<p>Have fruit and vegetables on KO. Move to Eatwell guide.</p> <p>Identify that animals need the right type and amount of nutrition.</p> <p>Look at function of skeleton and muscles.</p> <p>Discuss the Eatwell Guide and look at what different types of food do for the body.</p> <p>Classify animals with and without skeletons.</p>	<p>Have Eatwell Guide on KO from Year 3.</p> <p>Describe the simple functions of digestive system in humans (link to Y3 for food that we need).</p> <p>Identify types of teeth and their functions. (links to Year1 where chn looked at carnivores and herbivores.)</p> <p>Construct and interpret food chains. Identify producer, predator and prey.</p>	<p>Have types of animals (recap) and time lines from Year 2 on KO.</p> <p>Describe changes as humans move to old age - links to puberty and PSHE.</p> <p>Work carried on from Y2 timelines.</p>	<p>Identify and name parts of circulatory system - use of model on the yard (build on work from Y3 and 4 on skeleton, muscles and digestive system)</p> <p>Describe functions of heart, blood vessels and blood - use of heart model.</p> <p>Recognise the impact of diet, drugs, exercise and lifestyle on bodies - link to PSHE. Year 5 learn about drugs. Year 3 focuses on Eatwell Guide.</p>

	part is associated with each.		Look at the diets of animals - animal poo experiment. Design healthy meals - PSHE links.			
Mathematical links	Carroll diagrams used to classify data. Just because I am older, am I taller?	Timelines used to order events.	Eatwell Guide- look at this as a pie chart and how else you could show this. Classifying through Venn / Carroll diagrams.	Link measurement to the digestive system.	Compare and order mass / length of baby as it grows. Draw scatter graphs from data.	Heart beats per minute during exercise. Blood pressure / heart rate. Does your heart rate go up forever?
Curriculum links	<p>PSHE links to bodies growing and nutrition that we need. This is covered throughout our PSHR curriculum and Year 5/6 focus on puberty and body changes in more detail.</p> <p>We are part of Phunky Foods and have Year 5 Phunky Food ambassadors who relay messages about the importance of healthy eating across the school.</p> <p>We send Vegetable Bags home to encourage fresh home cooking and these are shared via Twitter.</p> <p>Links to PE in Year 6 when looking at heart rate.</p>					
Careers /Important people	Zoologist	Zoo veterinarian	Dietitian	Dentist	Health visitor	Cardiothoracic surgeons
Links to stories	Funny Bones	Handa's Surprise				

<p>Living things and their habitats</p>	<p>Children look at seasonal change - adopt a tree links.</p>	<p>Explore between living, dead and things that have never been alive - classifying and sorting.</p> <p>Identify how most living things live in habitats to which they are suited.</p> <p>Describe how different habitats provide basic needs.</p> <p>Explore microhabitats in the school grounds.</p> <p>Identify and name variety of plants and animals.</p> <p>Use simple food chains. Look at</p>	<p>Explore parts of flowers in school grounds eg daisies, dandelions.</p>	<p>Recognise that living things can be grouped in a variety of ways - use classification keys to help group - fish, amphibians, reptiles, birds, mammals (taught in Year 1). Invertebrates.</p> <p>Recognise environments can change and this can be a danger to living things - study how a habitat changes throughout the year.</p> <p>Study deforestation - Amazon Rainforest.</p>	<p>Describe differences in life cycles of mammal, amphibian, insect and bird (taught key words Y1, Y4)</p> <p>Describe life process of reproduction in some plants and animals - (PSHE links and Animals, inc Humans links)-</p> <p>Plant life cycle (bean)</p> <p>Creature life cycle (butterfly)</p>	<p>Describe how living things are classified into broad groups - micro-organisms, plants and animals (progress from Y4)</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>Use pooters to go into school grounds and explore habitats.</p> <p>Research unfamiliar animals and plants.</p>
---	---	---	---	---	--	---

		different sources of food.				
Mathematical links	Work on seasons and months of the year.	Classification through Venn diagrams. Use quadrants to count daisies (progress from Y1)	Estimation - how many daisies are there in ---- area?	Work on seasons and months of the year. Classifying.	Growing butterflies - links to time and how long things take. Growing and measuring beans.	Classifying.
Curriculum links	Links to Eco-work, gardening groups where children can investigate the environment. Through OPAL, children are encouraged to look after habitats such as our woodlands, pond area and garden area. Chicks are reared in FSU. All children are invited to see these.					
Careers / Important People		Environmental engineer		Conservation Research Assistant	David Attenborough Jane Goodall	Carl Linnaeus
Links to stories	How the Leaves Came Down by Susan Coolidge			Journey to the River Sea		
Materials	Distinguish between an object and the material from which it is made.	Identify and compare suitability of everyday materials. What materials have been used	Compare and group together materials based on whether they are attracted to a magnet (Forces	States of matter - Compare and group materials according to whether they are solid, liquid, gas	Progress from KSI work and Y4 work - group materials based on hardness, solubility, transparency, conductivity	Children use knowledge from previous years to make a burglar alarm - link electricity unit to

	<p>Identify and name a variety of everyday materials.</p> <p>Compare and group materials based on properties.</p> <p>Test - what is the best material for an umbrella?</p> <p>What is the best material to make a chair?</p>	<p>to build our school?</p> <p>Find out how shapes of solid objects made from some materials can be changed - bending, squashing, twisting, stretching.</p>	<p>and Magnets topic).</p> <p>Identify magnetic materials.</p> <p>Links to rock topic.</p>	<p>(progress from KSI).</p> <p>Observe some materials change state when heated or cooled. Measure temperature.</p> <p>Look at the water cycle - evaporation and condensation.</p>	<p>and response to magnets (Y3 work).</p> <p>Know that some materials will dissolve in liquid to form a solution.</p> <p>Y4 knowledge of solids, liquids and gases to separate mixtures.</p> <p>Give reasons for uses of everyday materials - Y1 work progression.</p> <p>Explore reversible changes and irreversible changes.</p>	<p>materials knowledge.</p>
<p>Mathematical links</p>	<p>Non standard forms of measuring capacity -</p>	<p>Venn diagrams used to sort materials.</p>	<p>Classifying.</p>	<p>Temperature work - reading a thermometer.</p>	<p>Capacity when working with mixtures.</p>	

	testing umbrella Non-standard form of measuring weight/mass on a chair			Set up water cycles in class - measure water and look at evaporation rates. Time taken for an ice cube to cool.		
Curriculum links	Water cycle in Year 4 - links with Geography.					
Careers/ Important People	Product designer	John Dunlop, Charles Macintosh, John McAdam.	Mechanical engineer	Hydrologist	Structural engineer	Electrical engineer
Story links	The Three Little Pigs	Dragon in a Wagon	Stone Age Boy			
Forces and magnets/ Forces	Group materials - NOT focussing on magnetism.	Group materials - NOT focussing on magnetism.	Compare how different things move on surfaces - car challenge on different surfaces. Measure distance. Magnetic forces can act at a distance.	Move to grouping materials based on solids, liquids and gases.	Explain unsupported objects fall to Earth due to gravity, Identify effects of - Air resistance: paper spinners Water resistance: plasticine ball in measuring cylinder.	

			<p>Observe how magnets attract or repel each other.</p> <p>Compare and group together materials based on magnetism. (Use skills of grouping materials from Year 1 and 2.)</p> <p>Describe magnets as having two poles. Make predictions based on poles.</p>		<p>Friction: car on surface (as in Y3) but look at friction.</p> <p>Explore pulleys, levers, gears.</p> <p>Isaac Newton.</p>	
Mathematical links			<p>Skills of measuring car distances. Ruler work.</p> <p>Graph work to show data. Count in multiples of 5/10 for axis.</p>		<p>Paper spinners - measure wing span, time using decimal numbers.</p> <p>Plasticine ball: Find mass of the ball, capacity of water in measuring cylinder.</p> <p>Friction: Time in decimals /</p>	

					<p>distance - measuring skills.</p> <p>Graph data. Intervals using different scales.</p>	
Curriculum links	Magnets taught in FSU. STEM week activities use magnetism for KSI children to maintain that focus.					
Careers/ Important people			Recycling officer		Sir Isaac Newton	

Biology / Physics / Chemistry