

Science Progression Map

Subject Intent

Our intent at St Oswald's is to encourage learners to become scientists who will be equipped with the necessary knowledge, skills and cultural capital to be contributing, well rounded citizens with high expectations and ambition.

To achieve this our curriculum will provide the learning for children to become scientists who have:

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings
- High levels of originality, imagination or innovation in the application of skills
- The ability to undertake practical work in a variety of contexts, including fieldwork
- A passion for science and its application in past, present and future technologies

National Curriculum	Threshold Concepts	Year Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Milestone 1		Milestone 2		Milestone 3	
Working Scientifically	Work Scientifically This Concept involves learning the methodologies of the discipline of science.	Use talk to help work out problems and organise thinking and activities Explain how things work and why they might happen Make observations on their environment and make links to prior knowledge and learning	Ask simple questions and recognise that they can be answered in different ways Observe 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		Ask relevant questions and use different types of scientific enquiries to answer them Set 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 Gather, record, classify and present data in a variety of ways to help in answering questions		Plan 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 Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	

					Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	Use test results to make predictions to set up further comparative and fair tests		
					Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations		
					Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Identify scientific evidence that has been used to support or refute ideas or arguments		
					Identify differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings			
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Plants	Understand Plants This concept involves becoming familiar with different types of plants, their structure and reproduction.	Name some common plants in their environment Know that we can eat some plants but some are harmful Know that plants we eat can be grown (on farms or gardens) Explore simple requirements for growing a plant	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	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	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			

		To identify simple parts of a plant			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			
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Animals, including humans	Understand animals and humans This concept involves becoming familiar with different types of animals including humans and the life processes they share.	Name parts of the body Name and identify our senses Know that animals and humans have a life cycle Know that animals and humans are living and some things are not living Know what some living things need in order to survive	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	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	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,	Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions construct and interpret a variety of food chains, identifying producers, predators and prey	Describe the changes as humans develop to old age	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

		Know, humans need to eat a balanced diet, exercise, sleep and drink water to grow healthily and to identify foods that are healthy or unhealthy	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	different types of food, and hygiene	protection and movement			animals, including humans
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Everyday materials Uses of everyday materials Properties and changes of materials	Investigate materials This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.	Know that all objects are made from materials Name a range of materials Describe and compare the properties of some materials Know that materials are chosen due to their properties Investigate materials - waterproof/ absorbent Explore changing states of matter and the processes involved	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	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			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	

		such as heating and freezing	Compare and group together a variety of everyday materials on the basis of their simple physical properties				<p>substance from a solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the</p>	
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Living things and their habitats	Investigate living things This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.	Name, sort and classify some minibeasts. To recognise the differences between habitats To recognise and sequence the life cycle of an insect Observe insects in their natural environment		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		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	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	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

				idea of a simple food chain, and identify and name different sources of food				
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Rocks	Investigate materials This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.	naming and comparing a range of materials			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			
Light	Understand light and seeing This concept involves understanding how light and reflection affect sunlight	light and dark day and night To know and use their senses to explore their world			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 appears to travel in straight lines Use the idea that light travels in straight lines to explain that objects are seen because they give

					<p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the size of shadows change</p>			<p>out or reflect light into the eye</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</p>
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Sound	<p>Investigate sound and hearing</p> <p>This concept involves understanding how sound is produced, how it travels, and how it is heard.</p>	<p>To know and use their senses to explore their world</p> <p>To compare and describe a range of musical instruments</p> <p>To describe and identify sounds they hear in their environment</p> <p>To explore and talk about voice sounds</p>				<p>Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear</p> <p>Find patterns between the</p>		

		To develop key skills in listening				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		
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Forces and magnets Forces	Understand movement, forces and magnets This concept involves understanding what causes motion.	To explore magnets and make observations To identify the properties of everyday materials			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		Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces Recognise that some mechanisms,	

					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 attract or repel each other, depending on which poles are facing		including levers, pulleys and gears, allow a smaller force to have a greater effect	
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Seasonal Change (Ongoing throughout the year)	Understanding the Earth's movement in space This concept involves understanding what causes seasonal changes, day and night.	<p>To know that we live on Earth</p> <p>To know that the Earth contains land and sea</p> <p>To know that Earth is in space</p> <p>To name and sequence days of the week, months of the year and seasons.</p> <p>To identify some changes that occur season to season</p>	<p>Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies</p>					

		<p>To know some holidays associated with different months</p> <p>To understand a cycle.</p> <p>To answer 'when' questions</p> <p>To use everyday words associated with time.</p>						
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States of matter	<p>Investigate materials This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.</p>	See above				<p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C)</p> <p>Identify the part played by evaporation and</p>		

						condensation in the water cycle and associate the rate of evaporation with temperature		
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Electricity	<p>Understand electrical circuits This concept involves understanding circuits and their role in electrical applications.</p>	<p>To know that some things use electricity to work and name some objects from school and home</p> <p>To recognise and name that some objects do not use electricity</p> <p>To know that electricity can be dangerous. (heat and shock)</p>				<p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</p> <p>Recognise that a switch opens and closes a circuit and associate</p>		<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p>

						<p>this with whether or not a lamp lights in a simple series circuit</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors</p>		
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Evolution and inheritance	<p>Understand evolution and inheritance This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct</p>	<p>now and then</p> <p>To understand that things happened before they were born</p> <p>To know changes that will happen to themselves as they grow</p>						<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit</p>

								their environment in different ways and that adaptation may lead to evolution
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Earth and Space	<p>Understanding the Earth's movement in space</p> <p>This concept involves understanding what causes seasonal changes, day and night</p>	See above					<p>Describe the movement of the Earth and other planets relative to the sun in the solar system</p> <p>Describe the movement of the moon relative to the Earth</p> <p>Describe the sun, Earth and moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p>	