

SCIENCE

Curriculum Map

Skills and Knowledge Progression



We align our topics and units of study with the National Curriculum; however, we enrich our provision with Snap Science scheme of work and Oakfield’s learning experiences that enable pupils to enjoy learning for life.

By the end key stage 2 the principal focus of science teaching is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. Pupils will build up a body of key foundational knowledge and concepts in readiness for their secondary education. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing relationships and interactions more systematically. By upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

End points

End points for lessons will be shared with pupils and they will be encouraged to self-assess against differentiated success criteria.

Vocabulary

Pupils will be introduced to and encouraged to use specialist technical language which will be given to them at the start of a lesson or topic.

Pupils should be taught:

- To develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- To develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- The scientific knowledge required to understand the uses and implications of science, today and for the future.

	Year 3	Year 4	Year 5	Year 6
Topics Studied	Science Enquiry Skills Animals including humans- nutrition & skeletons	Science Enquiry Skills Living things & their habitat Electricity	Science Enquiry Skills Forces Earth and Space	Science Enquiry Skills Evolution & Inheritance Electricity

	Rocks and Soils Forces and Magnets Light Plants	Animals including humans – digestion, teeth & food chains Sound States of Matter	Living things & their habitat – life cycles Animals including Humans Properties and changes of materials	Animals including humans – circulation & keeping healthy Light Living things & their habitat - classification
Working Scientifically Skills	<p>Ask relevant questions Make suggestions of how to find answers Set up simple practical Recognise whether a test is fair or not</p> <p>Use a range of equipment with some accuracy Make related observations Make some accurate whole number measurements Record observations in simple tables and bar charts Use simple labelled diagrams</p> <p>Make comparisons. Say what happened linking cause & effect. Use simple scientific vocabulary Identify any errors or problems</p>	<p>Identify some of the variables that need to be controlled. Identify things to measure/observe Select suitable equipment</p> <p>Suggest & use a range of equipment Carry out a fair test with help Suggest & make relevant systematic observations Make accurate measurements using standard units Suggest & record findings in a variety of ways including tables, labelled diagrams, bar charts</p> <p>With help, identify any patterns, changes, similarities or differences. Make conclusions based on findings and answer questions Suggest improvements & further tests. Use scientific language to communicate ideas. Use straightforward scientific evidence to answer questions or to support their findings</p>	<p>Recognise when to carry out a fair test. In fair testing identify variables to control</p> <p>Select equipment & use it accurately Make systematic observations using scientific vocabulary Make accurate measurements, beginning to repeat Record observations/measurements systematically in their own tables. Plot simple line graphs</p> <p>Find patterns in data Start to relate conclusions to patterns & scientific knowledge Begin to explain any differences in repeated observations/measurements</p>	<p>Select the most appropriate type of enquiry to use to answer a question. In fair testing, identify which variables to control & explain why.</p> <p>Select & use equipment safely & accurately, controlling risks Make a series of accurate observations using appropriate scientific vocabulary Make a series of repeated measurements with precision. Record more complex diagrams & classification keys with accuracy Record data of increasing complexity using bar charts & line graphs accurately.</p> <p>Note & comment on patterns in data Make oral & written conclusions consistent with evidence using scientific knowledge to explain Suggest improvements & further tests; making possible predictions Comment on the degree of trust in their results. Identify scientific evidence to support or refute ideas or arguments.</p>

Scientific Knowledge

<p>Plants</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 role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 		<ul style="list-style-type: none"> -describe the life process of reproduction in some plants 	
<p>All Living Things and their Habitats</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 constantly changing and that this can sometimes pose dangers to specific habitats 	<ul style="list-style-type: none"> -describe the difference 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 	<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 micro-organisms, plants and animals -give reasons for classifying plants and animals based on specific characteristics
<p>Animals, including humans</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 	<ul style="list-style-type: none"> -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 	<ul style="list-style-type: none"> -describe the changes as humans develop to old age 	<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 (including the pulse and clotting). -recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.

	support, protection and movement			-describe the ways in which nutrients and water are transported within animals, including humans
Evolution & Inheritance				-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
Rocks and soils	-compare and group together different kinds of rocks on the basis of their simple physical properties -recognise that soils are made from rocks and organic matter -describe in simple terms how fossils are formed when things that have lived are trapped within rock			
States of Matter		-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		
Properties & changes of materials			<ul style="list-style-type: none"> -compare and group together everyday materials based on evidence from comparative and fair tests, 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 metals, wood and plastic -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, include changes associated with burning and the action of acid on bicarbonate of soda 	
Forces & Magnets	<ul style="list-style-type: none"> -compare how things move on different surfaces -notice that some forces need contact between two 		<ul style="list-style-type: none"> -explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object 	

	<p>objects but magnetic forces act at a distance</p> <ul style="list-style-type: none"> -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 attract or repel each other, depending on which poles are facing 		<ul style="list-style-type: none"> -identify the effect of air resistance, water resistance and friction, that act between moving surfaces -recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect 	
Electricity		<ul style="list-style-type: none"> -identify common appliances that run on electricity -construct a simple series electrical circuit identifying and naming the basic parts of a simple electrical circuit, 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 		<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
Light	<ul style="list-style-type: none"> -recognise that they need light in order to see things 			<ul style="list-style-type: none"> -recognise that light appears to travel in straight lines

	<ul style="list-style-type: none"> and that dark is the absence of light -notice that light is reflected from surfaces -recognise that shadows are formed when a light source is blocked by a solid object -find patterns in the way that the size of shadows change -recognise that light from the Sun can be dangerous and that there are ways to protect our eyes 			<ul style="list-style-type: none"> -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
Earth and Space			<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 	
Sound		<ul style="list-style-type: none"> -identify how sounds are made, associating 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 the 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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