

# Science Curriculum Progression Early Years to Year 6



## Science at Mandale Mill Primary School-

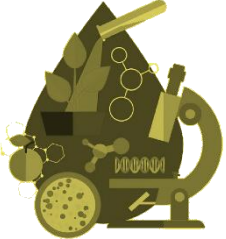


At Mandale Mill Primary School, our vision is to provide a Science curriculum which enables pupils to explore and discover the world around them, so that they have a deeper understanding of the world we live in. Our science curriculum offers the foundations for understanding the world through the specific disciplines of biology, chemistry and physics, with our curriculum design for Science promoting specific competences including knowledge, enquiry and working scientifically based skills. We provide a stimulating curriculum to further develop our children's enquiring minds, so they eventually become strong independent learners. The Science curriculum at Mandale Mill Primary School allows our children to make links to prior learning and develop key skills that are rich and challenging with the aim of providing our children with opportunities and experiences that will remain with them for the rest of their lives. By providing these opportunities to our children and giving them a positive experience of Science throughout their school journey, we can ensure that our children are motivated, confident, life-long learners who will continue to explore the world around them, way beyond their time in education.

**This document should be read in conjunction with the subject policy, the Teaching and Learning Policy and the Long-Term plan for each year group.**





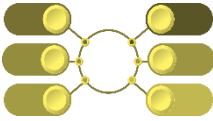


Science roadmap-

# Overarching principles-

## Key Science Strands-

Biology	Chemistry	Physics
<p>Biology is the study of living things. A biologist is a scientist who studies biology. Biologists try to understand the natural world and the things that live in it. These things include plants, animals, fungi, protozoa, algae, bacteria, and viruses. The study of biology covers many areas.</p>	<p>Chemistry is a field of science that studies the properties of matter and how matter interacts with energy. Chemistry is a physical science and is closely connected to physics.</p>	<p>Physics is the study of the relationship of objects, forces, and energy. Physics explains gravity, and the way things move, according to Newton's Laws of Motion. It also helps us understand behaviour and movement of energy such as heat, light and electricity.</p>
		

## Working Scientifically skills-

Plan	Do	Record	Review	Identify and classify	Research	Vocabulary
						
<p>When 'working scientifically', children investigate a range of processes, the nature and methods of science. They do this through a range of scientific skills including: observing over time; pattern seeking; identifying; classifying and grouping; comparative and fair testing (controlled investigations); and research using secondary resources. They learn how to plan investigations (varying only one factor at a time, ensuring it is a fair test); present their results (in tables and charts) and explain their findings. Encourage your child to look closely at things, ask questions and feed their curiosity.</p>						



## Working Scientifically Skills Progression-

	<b>Reception</b>	<b>Reception and Year 1</b> Knowledge built across the two years	<b>Year 2 and Year 3</b> Knowledge built across the two years	<b>Year 4 and Year 5</b> Knowledge built across the two years	<b>Year 6</b>
<b>Plan</b>	<p>The Natural World ELG Children at the expected level of development will:</p> <ul style="list-style-type: none"> <li>Explore the natural world around them, making observations and drawing pictures of animals and plants;</li> <li>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;</li> <li>Understand some important processes and changes in the natural world around them, including the seasons and</li> </ul>	<p>Ask a few simple questions about the world around us. Begin to use some different types of enquiry to answer questions.</p>	<p>Ask some relevant questions about the world around us. Use some different types of scientific enquiry to answer questions. Begin to decide which type of enquiry is best to answer the question. Make a simple prediction using prior scientific knowledge and understanding.</p>	<p>Begin to explore ideas and ask own questions about scientific phenomena. Begin to plan different types of scientific enquiry to answer questions. Begin to decide which variables to control. Make predictions based on scientific knowledge independently.</p>	<p>Explore ideas and ask own questions about scientific phenomena. Plan different types of scientific enquiry to answer questions. Decide which variables to control. Make predictions based on scientific knowledge and explain why confidently.</p>
<b>Do</b>		<p>With support, observe changes over time. With direction, begin to notice patterns. Begin to perform simple tests. Begin to discuss my ideas. Begin to say what happened in an investigation</p>	<p>Set up some simple practical enquiries. Including comparative and fair tests. Recognise when a simple fair test is necessary independently. Use standard measures and confidently measure to the nearest whole or half unit. Begin to help decide which variables to keep the same and which to change.</p>	<p>Sometimes set up a range of comparative and fair tests. Begin to explain which variables need to be controlled and why. Make a series of measurements adequate for the task. Begin to suggest improvements to the test, giving reasons.</p>	<p>Set up a range of comparative and fair tests. Explain which variables need to be controlled and why. Make a series of accurate measurements adequate for the task independently and confidently. Suggest improvements to the test, giving reasons.</p>
<b>Record</b>		<p>Begin to collect simple data. Begin to record data in a table the adult has provided. Begin to communicate findings in a variety of ways.</p>	<p>Begin to collect data in a variety of ways, including labelled diagrams, bar charts and tables. Begin to help decide how to record data.</p>	<p>Begin to record data and results of increasing complexity using – scientific diagrams and labels, classification keys, tables, bar graphs, line graphs.</p>	<p>Record data and results of increasing complexity using – scientific diagrams and labels, classification keys, tables, bar graphs, line graphs</p>

	<p>changing states of matter.</p> <p>People Culture and Communities ELG Children at the expected level of development will:</p> <ul style="list-style-type: none"> <li>Describe their immediate environment using knowledge from observation.</li> </ul>		<p>Begin to use some scientific language in my work.</p>	<p>Begin to choose how best to present data.</p> <p>Use some scientific language in my work.</p>	<p>Choose how best to present data.</p> <p>Confidently use the correct scientific language when appropriate.</p>
<b>Review</b>		<p>Begin to talk about what has been found out.</p> <p>Begin to explain how the enquiry was carried out.</p> <p>Begin to suggest simple changes to the enquiry.</p>	<p>Begin to draw simple conclusions based on the results of my enquiry.</p> <p>Begin to answer my questions using the results of my enquiry.</p> <p>Begin to use my findings to make new simple predictions, suggest improvements and think of new questions.</p>	<p>Begin to draw scientific, causal conclusions using the results of an enquiry to justify ideas.</p> <p>Begin to explain the conclusion using scientific knowledge and understanding.</p> <p>Begin to distinguish opinion and facts.</p> <p>Begin to use the findings to make predictions and set up further enquiries.</p> <p>Begin to use abstract models to explain my ideas.</p>	<p>Draw scientific, causal conclusions using the results of an enquiry to justify ideas.</p> <p>Explain the conclusion using scientific knowledge and understanding.</p> <p>Distinguish between opinion and facts.</p> <p>Use findings to make predictions and set up further enquiries.</p> <p>Begin to use abstract models to explain ideas.</p>
<b>Identify and classify</b>		<p>Explain where further additional items could be placed in a sorting/grouping task.</p>	<p>Begin to talk about and identify differences and similarities in the properties or behaviour of living things, materials and other scientific phenomena.</p> <p>Begin to identify simple changes related to simple scientific phenomena.</p> <p>Begin to discuss criteria for grouping and sorting and can classify using simple keys.</p>	<p>Begin to use keys and other information records to classify and describe living things, materials and other scientific phenomena.</p> <p>Begin to develop own keys and other information records to classify and describe.</p> <p>Begin to identify changes related to scientific phenomena.</p>	<p>Use keys and other information records to classify and describe living things, materials and other scientific phenomena.</p> <p>Develop own keys and other information records to classify and describe.</p> <p>Identify changes related to scientific phenomena.</p>
<b>Research</b>		<p>Begin to find information to help from books, computers and other familiar sources.</p>	<p>Begin to decide when research will help with the enquiry.</p> <p>Begin to carry out simple research independently.</p>	<p>Begin to recognise which secondary source will be most useful to research.</p> <p>Begin to carry out research independently.</p>	<p>Recognise which secondary source will be most useful to research.</p> <p>Carry out research independently.</p>

<b>Vocabulary</b>		Begin to use simple scientific language. Begin to describe what can be seen eg something is long. Begin to compare eg something is longer or shorter.	Begin to use some scientific language in own work.	Begin to confidently use the correct scientific language when appropriate.	Confidently use the correct scientific language when appropriate
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## Animals Including Humans-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> <li>• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</li> <li>• Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</li> <li>• Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</li> <li>• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</li> </ul>	<ul style="list-style-type: none"> <li>• Notice that animals, including humans, have offspring which grow into adults.</li> <li>• Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</li> <li>• Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Identify that humans and some animals have skeletons and muscles for support, protection and movement.</li> </ul>	<ul style="list-style-type: none"> <li>• Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> <li>• Describe the simple functions of the basic parts of the digestive system in humans.</li> <li>• Identify the different types of teeth in humans and their simple functions.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the changes as humans develop from birth to old age.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the ways in which nutrients and water are transported within animals, including humans.</li> <li>• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</li> <li>• Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</li> </ul>

## Earth and Space-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				<ul style="list-style-type: none"><li>• Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</li><li>• Describe the movement of the Moon relative to the Earth.</li><li>• Describe the Sun, Earth and Moon as approximately spherical bodies.</li><li>• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li></ul>	

# Electricity-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			<ul style="list-style-type: none"><li>• Identify common appliances that run on electricity.</li><li>• Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</li><li>• 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.</li><li>• Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</li><li>• Recognise some common conductors and insulators, and associate metals with being good conductors.</li></ul>		<ul style="list-style-type: none"><li>• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</li><li>• 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.</li><li>• Use recognised symbols when representing a simple circuit in a diagram.</li></ul>

## Everyday materials-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"><li>• Distinguish between an object and the material from which it is made.</li><li>• Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.</li><li>• Describe the simple physical properties of a variety of everyday materials.</li><li>• Compare and group together a variety of everyday materials on the basis of their simple physical properties.</li></ul>	<ul style="list-style-type: none"><li>• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</li><li>• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li></ul>				

## Evolution and Inheritance-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					<ul style="list-style-type: none"><li>• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</li><li>• Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</li><li>• Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li></ul>

## Forces and Magnets-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		<ul style="list-style-type: none"><li>• Compare how things move on different surfaces.</li><li>• Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</li><li>• Observe how magnets attract or repel each other and attract some materials and not others.</li><li>• 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.</li><li>• Describe magnets as having two poles.</li><li>• Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li></ul>		<ul style="list-style-type: none"><li>• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</li><li>• Identify the effects of air resistance, water resistance and friction that act between moving surfaces.</li><li>• Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have greater effect.</li></ul>	

# Light-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		<ul style="list-style-type: none"><li>• Recognise that they need light in order to see things and that dark is the absence of light.</li><li>• Notice that light is reflected from surfaces.</li><li>• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</li><li>• Recognise that shadows are formed when the light from a light source is blocked by a solid object.</li><li>• Find patterns in the way that the size of shadows change.</li></ul>			<ul style="list-style-type: none"><li>• Recognise that light appears to travel in straight lines.</li><li>• 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.</li><li>• 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.</li><li>• Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li></ul>

## Living Things and Their Habitats-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<ul style="list-style-type: none"> <li>• Explore and compare the differences between things that are living, dead and things that have never been alive.</li> <li>• 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.</li> <li>• Identify and name a variety of plants and animals in their habitats, including micro-habitats.</li> <li>• 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.</li> </ul>		<ul style="list-style-type: none"> <li>• Recognise that living things can be grouped in a variety of ways.</li> <li>• Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</li> <li>• Recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</li> <li>• Describe the life process of reproduction in some plants and animals.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Give reasons for classifying plants and animals based on specific characteristics.</li> </ul>



## Plants-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> <li>• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</li> <li>• Identify and describe the basic structure of a variety of common flowering plants, including trees.</li> </ul>	<ul style="list-style-type: none"> <li>• Observe and describe how seeds and bulbs grow into mature plants.</li> <li>• Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</li> <li>• 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.</li> <li>• Investigate the way in which water is transported within plants.</li> <li>• Explore the part that flowers play in the life cycle of a flowering plant, including pollination, seed formation and seed dispersal.</li> </ul>			

## Properties and Changes of Materials-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				<ul style="list-style-type: none"><li>• 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.</li><li>• Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</li><li>• Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</li><li>• Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</li><li>• Demonstrate that dissolving, mixing and changes of state are reversible changes.</li><li>• 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.</li></ul>	

## Rocks-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		<ul style="list-style-type: none"><li>• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</li><li>• Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</li><li>• Recognise that soils are made from rocks and organic matter.</li></ul>			

# Seasonal Changes-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"><li>• Observe changes across the four seasons.</li><li>• Observe and describe weather associated with the seasons and how day length varies.</li></ul>					

# Sound-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			<ul style="list-style-type: none"><li>• Identify how sounds are made, associating some of them with something vibrating.</li><li>• Recognise that vibrations from sounds travel through a medium to the ear.</li><li>• Find patterns between the pitch of a sound and features of the object that produced it.</li><li>• Find patterns between the volume of a sound and the strength of the vibrations that produced it.</li><li>• Recognise that sounds get fainter as the distance from the sound increases.</li></ul>		

## States of Matter-

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			<ul style="list-style-type: none"><li>• Compare and group materials together, according to whether they are solids, liquids or gases.</li><li>• 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.</li><li>• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li></ul>		

