

## St Michael's C of E Primary School – Science Progression - 2021-22

<b>Working Scientifically</b>					
<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
<ul style="list-style-type: none"> <li>• ask simple questions and recognise that they can be answered in different ways</li> <li>• observe closely, including changes over time</li> <li>• carry out simple tests using simple equipment and making simple measurements</li> <li>• use simple features to identify, compare, sort, group and classify objects, materials and living things</li> <li>• gather and record data to help answer questions</li> <li>• use simple secondary sources to find answers</li> <li>• use observations and ideas to suggest answers to questions</li> <li>• begin to notice patterns and relationships</li> <li>• record and communicate findings using simple scientific language</li> </ul>		<ul style="list-style-type: none"> <li>• ask relevant questions and use different types of scientific enquiries to answer them</li> <li>• set up simple practical enquiries, comparative and fair tests, and begin to make decisions about the most appropriate type of scientific enquiry to use</li> <li>• make systematic and careful observations, including over time</li> <li>• gather, record, classify and present data in a variety of ways to help answer questions</li> <li>• learn to take and record accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>• record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>• identify differences, similarities, patterns or changes related to simple scientific ideas and processes</li> <li>• use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>• use straightforward scientific evidence to answer questions or to support their findings, including from secondary sources</li> <li>• report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions, using relevant scientific language</li> </ul>		<ul style="list-style-type: none"> <li>• plan different types of scientific enquiries to answer questions, selecting the most appropriate type of enquiry, and recognise and control variables where necessary</li> <li>• make own decisions about how to carry out an investigation including what observations and measurements to make, choice of variable etc.</li> <li>• take measurements, using a range of scientific equipment, with increasing accuracy and precision, take repeat readings when appropriate</li> <li>• record observations, data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>• identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment</li> <li>• recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact</li> <li>• use test results to make predictions to set up further comparative and fair tests</li> <li>• identify scientific evidence that has been used to support or refute ideas or arguments</li> <li>• report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations, using relevant scientific language</li> </ul>	



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### Reception Class

Children explore the natural world around them, including in Forest School and the greenhouse. They make observations and create images, models and scenarios involving animals and plants. They know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have been exposed to in class. They learn to understand some important processes and changes which they experience in the natural world around them, for example the seasons and changing states of matter.

Animals, including humans					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Name animals and describe them using scientific vocabulary.</p> <p>Group animals according to their features and what they eat.</p> <p>Describe animals' needs.</p> <p>Consider how humans change as they age.</p> <p>The 5 senses.</p> <p>Name parts of human body.</p>	<p>Development of chick in the egg and how it grows into a hen.</p> <p>Know that animals produce offspring.</p> <p>Similarities and differences between adults and babies.</p> <p>Understand what animals need for survival.</p> <p>Understand exercise makes the heart work faster.</p> <p>Food groups.</p> <p>Hygiene and food preparation.</p>	<p>Characteristics of a healthy diet.</p> <p>Main parts and function of the skeleton.</p> <p>Differences and similarities between vertebrates and invertebrates.</p> <p>Muscles and how they work in pairs.</p> <p>How the diaphragm works and how to measure lung capacity.</p>	<p>How to keep teeth healthy.</p> <p>Shape and function of different teeth.</p> <p>Comparison of the teeth of carnivores and herbivores.</p> <p>Functions of the basic parts of the digestive system.</p> <p>Compare the diets of humans with other animals.</p> <p>Diets of carnivores, herbivores and omnivores.</p> <p>Food chains and the function of predators, prey and producers.</p> <p>Impact of a break in the food chain.</p>	<p>Gestation periods of a range of animals including humans.</p> <p>Key stages of human foetal development.</p> <p>Growth and development of the human body from birth to age 5.</p> <p>Key physical and emotional changes during puberty in boys and girls.</p> <p>Physical and mental changes to the human body as it ages.</p>	<p>Identify and describe components of blood and their respective functions, noting the different blood groups.</p> <p>Name the three types of blood vessel: arteries, veins and capillaries.</p> <p>Explore the structure and function of the human heart.</p> <p>Explain how nutrients and water are transported through the body: diffusion and osmosis.</p> <p>Explore how the circulatory system works and the role blood has within this.</p> <p>Identify the effects of drugs on the human body</p>



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Living things and their habitats					
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Describe animals' needs.	<p>Difference between things that are living and dead and things that have never been alive.</p> <p>Differences in habitats: small and local; microhabitats; large habitats.</p> <p>How habitats vary according to the needs of their inhabitants and that a variety of creatures can live in the same habitat.</p> <p>Food chains, including need of some living things to eat other living things and the co-dependence of plants and animals.</p> <p>Understand the role the sun's energy plays in a food chain.</p> <p>Understand the role farms play in the food chain.</p>	7 life processes.	<p>7 characteristics of a living thing.</p> <p>Living things in the local environment and their habitats.</p> <p>Features of insects, arachnids, animals and plants in the local area.</p> <p>Sort and identify local invertebrates using branching database.</p> <p>Understand that tiny details allow scientists to classify living things.</p> <p>Create branching databases for a range of living things.</p> <p>Natural and man-made changes to the environment.</p> <p>Impact of climate change – positive and negative.</p>	<p>Lifecycle and reproduction of flowering plants.</p> <p>Identify and explain ways plants reproduce naturally and artificially.</p> <p>Lifecycles of insects and amphibians.</p> <p>Lifecycle of local mammal and bird species.</p>	<p>Linnaeus and classification.</p> <p>Group animals, micro-organisms and plants into broad groups and sub groups based on observable features.</p> <p>Design and test classification key for a group of animals and or local plant life.</p> <p>Research and write scientific descriptions of unusual living things.</p> <p>Design, describe, name and sketch a new creature that sits within a known classification route.</p>



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Plants & Evolution and Inheritance					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Identify and name common wild and garden plants.</p> <p>Identify a range of evergreen and deciduous trees from their leaves.</p> <p>Describe and identify basic structure of flowering plants.</p> <p>Consider what a seed needs to grow.</p>	<p>Why and how plants disperse seeds.</p> <p>What a bean needs to grow - set up hydroponic growth system for bean.</p> <p>Seeds need, light, water and warmth to germinate and grow.</p>	<p>Explore what plants need for health and growth: light, water, nutrients, room for growth, and how this varies between different plants.</p> <p>Transportation of water in plants.</p> <p>Identify and describe functions of different parts of flowering plants.</p> <p>Role of the flower in life cycle of a flowering plant.</p> <p>Role of insects in pollination and what happens to a plant after pollination.</p> <p>Variation in types of fruit and how this aids seed dispersal.</p>		<p>Lifecycle and reproduction of flowering plants.</p> <p>Identify and explain ways plants reproduce naturally and artificially.</p>	<p>Identify variations in humans and animals.</p> <p>Identify adaptations to environments in the animal and plant world, including adaptations to extreme environments.</p> <p>Identify advantages and disadvantages of certain characteristics.</p> <p>Design an animal and a plant that should thrive and survive in a given environment.</p> <p>Use given evidence to attempt to back up evolutionary ideas, presenting logical findings.</p> <p>Explore the evolution of flight in birds through the fossil record</p> <p>Create a cladogram using modern animals</p> <p>Explain scientifically how a given creature has evolved in terms of a specific characteristic.</p>



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Properties of Materials and States of Matter					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Identify and name everyday materials.</p> <p>Describe simple physical properties of materials.</p> <p>Test and investigate properties of materials including whether they are magnetic or waterproof.</p> <p>Changing state: ice and water.</p> <p>Measure temperature inside and outside the classroom.</p>	<p>Create hypotheses, make predictions and investigate: absorbency of materials; bounciness of balls; stretchiness of fabrics; rigidity of materials; durability and toughness of materials; strength of paper.</p> <p>Investigate whether hard materials can absorb liquid.</p> <p>Explore how to waterproof materials, including using wax.</p> <p>Understand difference between man made and natural materials and their properties.</p> <p>Understand effects of heating some materials.</p>		<p>How the properties of solids, liquids and gases are different.</p> <p>Know that all substances are made of particles.</p> <p>The arrangement of particles changes when a substance changes state.</p> <p>Some changes of state are reversible.</p> <p>Liquids have a solidifying point (to become a solid) and a boiling point (to become a gas).</p> <p>The different stages of the water cycle – evaporation and condensation.</p>	<p>The properties of everyday materials and their suitability for use as: thermal conductors and insulators; electrical conductors and insulators; soundproofing</p> <p>Compare properties of a range of materials: strength, absorbency, durability and how fit they are for specific purposes.</p> <p>Investigate soluble materials.</p> <p>Separate materials using filtration, evaporation and sieving.</p> <p>How cooking creates irreversible changes.</p> <p>The effects of oxidation.</p> <p>Investigate new materials and how they are discovered.</p>	



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<b>Light &amp; Sound</b>					
<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
<p>Making and observing shadows.</p>		<p>We need light to see.</p> <p>Light sources including the sun.</p> <p>Light travels in straight lines.</p> <p>Light is composed of a spectrum of coloured light.</p> <p>How light is reflected by different surfaces.</p> <p>We cannot see without light.</p> <p>Formation of shadows: opaque, translucent and transparent objects; length of shadow in relation to the distance of the light source from an object.</p>	<p>Know that there are many kinds of sound.</p> <p>Sound is made by vibration from a source.</p> <p>Sound travels through many different mediums including air, water and solids</p> <p>Sound is a form of energy and the more energy that is put into making a sound, the louder the sound is.</p> <p>Patterns exist between the pitch of a sound and features of the object that produced it.</p> <p>We hear because sound waves enter our ears.</p> <p>Sounds become fainter as the distance from the sound source increases.</p> <p>Investigate how materials can be used to reduce sound.</p>		<p>Demonstrate and conclude that light travels in a straight line.</p> <p>Demonstrate and describe the movement of light off mirrors.</p> <p>Explain that a human shadow has the same shape as the person casting it.</p> <p>Investigate lenses and prisms.</p> <p>Explain and demonstrate that light can be bent when it is slowed down.</p> <p>Split white light into rainbow colours.</p>



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Forces and Magnets					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Learn about the direction of the wind using a weather sock.		<p>Forces are pushes and pulls and make things move, stop, change direction and shape.</p> <p>Gravity and magnetism are forces that act without contact.</p> <p>Investigate magnetic materials.</p> <p>Magnets have 2 poles: the same poles repel and opposite poles attract.</p>	<p>Gravity and air resistance.</p> <p>Balanced and unbalanced forces.</p> <p>Levers: the impact of the position of the fulcrum, load and effort</p> <p>How pulleys work and how the number of pulleys changes the effort required.</p> <p>How gears and gear ratios work.</p> <p>The effect of friction on movement.</p> <p>The effect of boat shape on water resistance.</p>		



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<b>Electricity</b>					
<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
			<p>Identify common appliances powered by mains electricity or batteries.</p> <p>The dangers of electricity and electrical safety.</p> <p>Construct simple circuits using wires, cells, bulbs, motors and buzzers.</p> <p>Know the symbols for electrical components and draw simple circuit diagrams.</p> <p>Know how a switch works to stop the flow of electricity.</p> <p>Identify materials that act as electrical insulators and conductors and investigate how they affect a simple circuit.</p>		<p>Explore and explain the effects of different voltages on the components in a circuit.</p> <p>Explain the role of resistance in making electrical components work.</p> <p>Draw electrical circuit diagrams using recognised symbols.</p> <p>Create a working electrical circuit for use within a product.</p>



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Rocks and Fossils & Earth and Space					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		<p>Observe, group, draw, describe and name rock samples.</p> <p>How rocks on Earth were made.</p> <p>Testing rocks for hardness and permeability.</p> <p>Purposes for which different rocks are used.</p> <p>How fossils are made.</p> <p>Properties of soils and how these properties can be tested.</p>		<p>Create a model of the solar system, researching scales, ratios and images.</p> <p>The difference between a geo and heliocentric solar system.</p> <p>Investigate how shadows change throughout the day and what this indicates about the movement of the Earth.</p> <p>Different time zones around the world.</p> <p>Why the moon appears to change shape over a month.</p>	

