

# SCIENCE Subject Progression

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| <b>Purpose of Study</b>             | <p>A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.</p>  |                                      |  |
| <b>School Intent</b>                | <p>At St Catherine's Catholic Primary School, we believe that an understanding of key geographical concepts is vital for our children's development and our geography curriculum intent is rooted in three of our curriculum drivers of 'being Amazing Adventurers, Confident Communicators, Ready Readers and Writers Spiritual and Secure and Happy and Healthy'. It is our goal that all children should develop:</p> <ul style="list-style-type: none"> <li>● a knowledge and understanding of places in the world.</li> <li>● a knowledge of other cultures and a respectful understanding of what it means to be a positive citizen in a multicultural country.</li> <li>● a passion for, and commitment to sustainable development with an understanding of environmental issues at a local, national and global scale.</li> <li>● effective key geographical skills such as enquiry, investigation, analysis, interpretation, evaluation and presentation, as well as how to use, draw and interpret maps.</li> </ul> |                                      |  |
| <b>Teaching Sequence in Science</b> | <ol style="list-style-type: none"> <li>1. Arouse curiosity through question, investigation, object or story</li> <li>2. Ask questions</li> <li>3. Develop understanding of working scientifically and make connections.</li> <li>4. Immerse and explore using equipment to organise, measure and test ideas and answer questions.</li> <li>5. Focused investigations with teacher modelling.</li> <li>6. Interpret findings, discuss and/or report to an audience.</li> </ol>   | <b>School's Pedagogical Approach</b> | <ol style="list-style-type: none"> <li>1. Daily review</li> <li>2. Present new material using small steps</li> <li>3. Ask questions</li> <li>4. Provide models</li> <li>5. Guide pupil practice</li> <li>6. Check for pupils understanding</li> <li>7. Obtain a high success rate</li> <li>8. Provide scaffolds for difficult tasks</li> <li>9. Independent practice</li> <li>10. Weekly and monthly review</li> </ol> |

|  | Reception<br>Y1  | Y2   | Y3<br>Y4   | Y4/ Y5  | Y5/6   |
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| Trip   |  |  |  |   |  |
| Autumn                                       | <b>Seasonal changes</b><br>(throughout year) 4 seasons, describe weather   | <b>Animals including Humans</b><br>Animals offspring/needs<br>Human - exercise, eating   | <b>Animals including humans</b><br>Nutrition, skeleton, muscles  | <b>Earth and Space</b><br>Movement of earth/sun<br>Solar system/rotation day and night  | <b>Forces</b><br>Gravity/air resistance/levers pulleys, gears  |
| Spring                                       | <b>Plants</b><br>identify basic structure/<br>name variety   | <b>Plants</b><br>Seeds and bulbs into plants   | <b>Living things and habitats</b><br>Grouping/classification<br>environments and change  | <b>Living things and habitats</b><br>Life cycles, reproduction<br>animals and plants  | <b>Living things and habitats</b><br>classification plants and animals   |
| Summer                                       | <b>Plants</b><br>identify basic structure/<br>name variety   | <b>Plants</b><br>Seeds and bulbs into plants   | <b>Rocks Compare and group,</b><br>fossils   | <b>States of matter</b><br>Solids, liquids gases/heating<br>cooling   | <b>Properties and changes of</b><br>materials properties,<br>reversible/irreversible   |
| Additional one-day local Science field study |  |  |  |   |  |
| <b>Working Scientifically</b>                | <p>Can ask simple questions and recognise that they can be answered in different ways.</p> <p>Can observe closely, using simple equipment.</p> <p>Can perform simple tests.</p> <p>Can identify and classify.</p> <p>Can use their observations and ideas to suggest answers to questions.</p> | <p>Can ask simple questions and recognise that they can be answered in different ways.</p> <p>Can observe closely, using simple equipment.</p> <p>Can perform simple tests.</p> <p>Can identify and classify.</p> <p>Can use their observations and ideas to suggest answers to questions.</p> <p>Can gather and record data to help in answering questions.</p> | <p>Can ask relevant questions and use different types of scientific enquiries to answer them.</p> <p>Can set up simple practical enquiries, comparative and fair tests.</p> <p>Can make systematic and careful observations and, where appropriate, take accurate measurements using standard units.</p> <p>Can gather, record, classify and present data in a variety of ways to help in answering questions.</p> | <p>Can ask relevant questions and use different types of scientific enquiries to answer them.</p> <p>Can set up simple practical enquiries, comparative and fair tests.</p> <p>Can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Can gather, record, classify and present data in a variety of ways to help in answering questions.</p> | <p>Can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Can use tests results to make predictions to set up further comparative and fair tests.</p> |

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|  | <p>Can gather and record data to help in answering questions.</p> <p>Explore the world around them using their senses.</p> <p>Sort and group objects, materials and living things, recognising simple features .</p> <p>Ask questions about what they have found out.</p> <p>Carry out simple tests and talk about what they have found out.</p> | <p>Explore the world around them raising questions.</p> <p>Recognise that a test needs to be fair.</p> <p>Discuss the criteria for grouping, sorting and classifying.</p> <p>Compares objects, materials and living things.</p> <p>Observe changes over time, noticing patterns and relationships.</p> <p>Ask questions and use simple secondary sources to find answers.</p> <p>Using simple measurements and equipment to record data, and use simple scientific language to communicate their findings in a range of ways.</p> | <p>Can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p> <p>Can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Can use results to draw simple conclusions, make predictions and suggest improvements.</p> <p>Can identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Can use scientific evidence to answer questions or to support their findings.</p> <p>Set up a fair test and why it's necessary.<br/>Learn to use simple keys.<br/>Use equipment to make simple observations and how long to make them for.</p> <p>Understand how to use new equipment to collect data. Collect data and make decisions on how to record and analyse this data.</p> <p>Recognise changes, patterns, similarities and differences in their data to draw simple conclusions and answer questions.</p> <p>Identify questions arising from the data and make predictions.</p> <p>Suggest ways of improving what they have already done.</p> <p>Use secondary sources to help them answer questions that</p> | <p>Can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Can use results to draw simple conclusions, make predictions and suggest improvements</p> <p>Choose the most appropriate type of scientific enquiry to answer questions.</p> <p>Look for naturally occurring patterns and relationships and identify them by collecting data. Should use their scientific experiences to explore ideas and raise different kinds of questions; select and plan the appropriate type of scientific inquiry to answer scientific questions.</p> <p>Recognise when and how to set up fair tests and explain which variables are needed and why.</p> <p>Develop keys to identify, classify and describe living things and materials.<br/>Identify patterns that might be found in the natural environment.</p> <p>Make their own decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them.</p> <p>Choose the most appropriate equipment to make measurements and how to use them accurately.</p> <p>Record data from a choice of familiar approaches.<br/>Look for different causal relationships in their data.</p> | <p>Can 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.<br/>Can identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Should use their scientific experiences to explore ideas and raise different kinds of questions; select and plan the appropriate type of scientific inquiry to answer scientific questions.</p> <p>Recognise when and how to set up comparative and fair tests and explain why variables need to be controlled.</p> <p>Develop keys and use other information to identify, classify and describe living things and materials.</p> <p>Identify patterns that might be found in the natural environment.</p> <p>Make their own decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them.</p> <p>Choose the most appropriate equipment to make measurements and how to use them accurately.<br/>Record data from a choice of familiar approaches.</p> <p>Look for different causal relationships in their data and identify evidence that refutes or supports their ideas. Use their results to identify when further tests and observations might be needed.</p> |
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|  |   |  | <p>cannot be answered through practical investigations.</p> <p>Use relevant scientific language to discuss their ideas and communicate their findings for different audiences.</p>  | <p>Use their results to identify when further tests and observations might be needed.</p> <p>Use secondary sources and begin to separate opinion from fact.</p> <p>Recognise scientific ideas have developed over time.</p> <p>Use scientific language and illustrations to discuss, communicate and justify their scientific ideas.</p> | <p>Use secondary sources and begin to separate opinion from fact.</p> <p>Recognise scientific ideas have developed over time.</p> <p>Use scientific language and illustrations to discuss, communicate and justify their scientific ideas.</p> |
| <p><b>MILESTONES</b></p> <p><b>Plants.</b></p> | <p>Can make observations of plants and explain why some things occur.</p> <p>Can talk about changes in plants.</p> <p>Can know the differences and similarities in relation to plants.</p> <p>Can identify and name a variety of common wild and garden plants, including deciduous and evergreen.</p> <p>Can identify and describe the basic structure of a variety of common flowering plants, including trees.</p> | <p>Can observe and describe how seeds and bulbs grow into mature plants.</p> <p>Can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Can observe changes across the four seasons.</p> <p>Can observe and describe weather associated with the seasons and how day length varies.</p> | <p>Can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>Can 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.</p> <p>Can investigate the way in which water is transported within plants.</p> <p>Can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>Can observe and describe weather associated with the seasons and how day length varies.</p> | <p>REVIEW</p>  | <p>REVIEW</p>  |

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| <b>MILESTONES</b><br><b>Living things- animals and humans</b> | <p>Can make observations of animals and explain why some things occur.</p> <p>Can talk about changes in animals.</p> <p>Can know the differences and similarities in relation to animals.</p> <p>Can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Can identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>Can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</p> <p>Can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p> | <p>Notice that animals, including humans, have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p>Can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p> | <p>Can 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.</p> <p>Can identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> <p>Can describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Can identify the different types of teeth in humans and their simple functions.</p> <p>Can construct and interpret a variety of food chains, identifying producers, predators and prey</p> | <p>Can describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Can identify the different types of teeth in humans and their simple functions.</p> <p>Can construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p>Can describe the changes as humans develop to old age.</p> | <p>Can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Can describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>Can 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>Can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> |
| <b>MILESTONES</b><br><b>HABITATS</b>                          | <p>Talk about features about their own immediate environment and how their own environments might vary from one and another.</p>  | <p>.</p> <p>.</p>   | <p>Talk about features about their own immediate environment and how their own environments might vary from one and another.</p> <p>Can explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>Can describe how animals obtain their food from plants</p>   | <p>Can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Can describe the life process of reproduction in some plants and animals.</p>  | <p>Can 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.</p> <p>Can give reasons for classifying plants and animals based on specific characteristics</p>   |

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|   |   |   | <p>and other animals, using the idea of a simple food chain, and identify and name different sources of food</p> <p>Can group and classify plants and animals according to their features and characteristics.</p> |   |   |
| <b>MILESTONES</b><br><br><b>Earth and Space</b> | <p>Can recognise that they need light in order to see things and that dark is the absence of light.</p> | <p>Can recognise that they need light in order to see things and that dark is the absence of light.</p> |  | <p>Can describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Can describe the movement of the Moon relative to the Earth.</p> <p>Can describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p>Can identify how sounds are made, associating some of them with something vibrating.</p> <p>Can recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Can find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Can find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Can recognise that sounds get fainter as the distance from the sound source increases.</p> | <p>Can 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.</p> <p>Can 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>Can 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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| <b>MILESTONES<br/>MATERIALS<br/>AND THEIR<br/>PROPERTIES</b> |  |  | <p>Can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Can describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Can recognise that soils are made from rocks and organic matter.</p> <p>Can compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>Can 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).</p> <p>Can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> | <p>Can compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Can 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).</p> <p>Can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> | <p>Can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>Can know some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Can demonstrate that dissolving mixing and changes of state are reversible changes.</p> <p>Can 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</p> |
| <b>MILESTONES<br/>FORCES</b>                                 |  |  |  |   | <p>Can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Can identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>Can recognise that some mechanisms, including levers,</p>   |

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|  |  |  |  |  | <p>pulleys and gears, allow a smaller force to have a greater effect</p> |
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