

**Water Mill Primary School**  
**Curriculum Planning – Key skills and knowledge covered in each Year group**  
**Science**

| KS2                                       |   |  |  |  |
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| <b>Teaching sequence in science</b>       | <ul style="list-style-type: none"> <li>● Big Picture: Start with what the children know, understand, are able to do and able to say. Daily Review: Revisit previous learning.</li> <li>● Provide information and scientific concepts</li> <li>● Specify key vocabulary to be used and its meaning.</li> <li>● Provide opportunities for the children to investigate in a variety of contexts.</li> <li>● Obtain and present evidence through observations, comparisons and collected data</li> <li>● Consider and evaluate evidence making connections with scientific knowledge and understanding</li> </ul>   | <b>Learning, working and talking like a scientist</b>  | <b>Being introduced to the key terms and vocabulary that a scientist would use and encouraging use of correct vocabulary when writing and talking about science</b>  |  |
|   |   |  | <b>Concepts</b>  | <b>Explanation</b>   |
|   |   |  | Structure  | Anything composed of parts arranged together in some way   |
|   |   |  | Function   | A specific job or procedure  |
|   |   |  | Variation  | The presence of differences between living things of the same species  |
|   |   |  | Adaptation   | The process by which animals, plants and other living things have changed so that they better suit their habitat   |
|   |   |  | Cause and effect   | Cause is why something happens<br>Effect is what event has happened as a result of this  |
|   |   |  | Changes  | Changing from one material/state to another  |
|   |   |  | Evolution  | The way that living things change over time  |
|   |   |  | Growth   | The process of increasing in size  |
|   |   |  | Energy   | Strength and power. There are many forms such as thermal (heat), radiant (light) or kinetic (movement)   |
|   |   |  | Process  | A series of actions or steps taken in order to achieve a particular end  |
|   |   |  | Similarity and Difference  | Similarity is sameness or a likeness between things and differences are a point or way in which people or things are dissimilar  |
| Working scientifically                    | The processes of science: asking questions, designing experiments, reasoning and arguing with scientific evidence and analysing and interpreting data   |  |  |  |
|   | <b>Year 3</b>   | <b>Year 4</b>  | <b>Year 5</b>  | <b>Year 6</b>  |
| <b>Working Scientifically Progression</b> | <ul style="list-style-type: none"> <li>● Raising their own relevant question and suggesting the appropriate enquiry to answer it.</li> <li>● Suggesting more than one way of grouping animals and plants and explaining their reasons.</li> <li>● Setting up and carrying out a suggested investigation.</li> <li>● Classifying with a simple key.</li> <li>● Saying whether things happened as they expected and if not, why not.</li> <li>● Collecting and grouping observations and measurements in their own tables, bar charts and diagrams.</li> <li>● Taking accurate measurements using standard units.</li> <li>● Suggesting suitable information sources including books, internet and interviewing.</li> <li>● Beginning to look for naturally occurring patterns and relationships and deciding what data to collect to identify them.</li> <li>● Saying whether things happened as they expected and if not, why not.</li> </ul> | <ul style="list-style-type: none"> <li>● Beginning to make links to what they already know.</li> <li>● Suggesting the appropriate enquiry to make and recognising when it is appropriate to test or to use a secondary source.</li> <li>● Recognising when a test is fair and suggesting ways to keep it fair.</li> <li>● Identifying naturally occurring patterns and relationships and drawing simple conclusions from these.</li> <li>● Classifying with a simple key.</li> <li>● Using data loggers / thermometers.</li> <li>● Recording and presenting what they have found using scientific language, drawings, labelled diagrams, bar charts, tables and classification keys.</li> <li>● Explaining their findings in different ways - display, presentation and/or writing.</li> <li>● Using their findings to draw simple conclusions.</li> <li>● Suggesting how to improve their work if they did it again.</li> </ul> | <ul style="list-style-type: none"> <li>● Raising their own question and applying their knowledge to make predictions.</li> <li>● Beginning to separate fact and opinions in secondary sources.</li> <li>● Planning and carrying out an investigation by controlling variables fairly and accurately.</li> <li>● Deciding how to record their data.</li> <li>● Recording more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models.</li> <li>● Using classification keys to identify.</li> <li>● Identifying whether their results support or refute their predictions and ideas.</li> <li>● Using test results to make further predictions and setting up further comparative tests.</li> <li>● Reporting findings from investigations through written explanations and conclusions.</li> </ul> | <ul style="list-style-type: none"> <li>● Selecting and planning the most appropriate type of enquiry.</li> <li>● Using information to help them make a prediction.</li> <li>● Varying one factor whilst keeping the others the same in an experiment.</li> <li>● Explaining (in simple terms) a scientific idea and what evidence supports / refutes it.</li> <li>● Deciding which units of measurement they need to use.</li> <li>● Taking repeat measurements where appropriate and explaining why a measurement needs to be repeated.</li> <li>● Identifying the method of recording results.</li> <li>● Developing their own classification keys.</li> <li>● Finding a pattern from their data and explaining what it shows.</li> <li>● Linking what they have found out to other science knowledge.</li> <li>● Suggesting how to improve their work and say why they think this.</li> </ul> |



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| <p><b>Taps:</b> Investigating ice cubes</p> <p><b>Plan:</b> Suggesting the appropriate enquiry to make.</p> <p>Recognising when a test is fair and suggesting ways to keep it fair.</p> <p><b>Do:</b> Present findings using scientific vocabulary</p> <p><b>Record:</b> Their findings in writing</p> <p><b>Evaluate:</b> Explain their findings in writing</p> | <p><b>States of matter</b></p> <p>What are the different states of materials? (gas, liquid and solids) Can I group materials according to their states? How do some materials change state when they are heated or cooled? At what temperature do these changes happen (in degree Celsius)? What is evaporation and condensation and how do these influence the water cycle? What happens to water as it is heated and cooled to various temperatures?</p> | <p><b>Taps:</b> Digestion diagrams</p> <p><b>Do:</b> Draw and label the digestive system.</p> <p><b>Record:</b> The functions of each part.</p> <p><b>Taps:</b> Teeth</p> <p><b>Plan:</b> To find out what damages teeth</p> <p><b>Do:</b> Experiment with different liquids on eggs</p> <p><b>Record:</b> Using a table</p> <p><b>Evaluate:</b> Present findings as a news report</p> | <p><b>Animals including humans</b></p> <p>What are the simple functions of the basic parts of the digestive system in humans? Can I record these and label them on a diagram? What are the different types of teeth in a human and what are their simple functions?</p> <p><b>Food chains</b></p> <p>What are predators and prey? Can you construct and interpret a variety of food chains? Can I use secondary sources to identify predators and their prey?</p> | <p><b>Taps:</b> Conductors and insulators</p> <p><b>Plan:</b> A comparative and fair test</p> <p><b>Do:</b> Make predictions Test circuits with a variety of possible conductors.</p> <p><b>Record:</b> Present findings and conclusions using labelled diagrams</p> | <p><b>Sound</b></p> <p>How are sounds made? (vibration) How do vibrations travel? Are there patterns between the volume of a sound and the strength of the vibration? What happens to sound as the distance from the sound source increases?</p> <p><b>Electricity</b></p> <p>What common appliances run on electricity? What are the different parts to a circuit? (cell, wires, bulbs, switches and buzzers) How does a switch work and will this light a lamp in a simple series circuit? What are common conductors and isolators? What are good conductors?</p> | <p><b>Taps:</b> Animal keys</p> <p><b>Plan:</b> A variety of questions</p> <p><b>Do:</b> Classifying data in a variety of ways to help in answering questions</p> <p><b>Record:</b> Using a branching data base</p> <p><b>Evaluate:</b> How effective was the data base to classify the animals?</p> | <p><b>Living things and their habitats</b></p> <p>Can you group living things according to specific characteristics? How do you use a key to identify local plants and animals? Can I identify plants and animals in the local area and group them by specified characteristics? Can I use secondary sources to aid identification? What environmental changes can pose dangers to living things? What ways can we protect living things and the environment?</p> |
| Vocabulary   | See vocabulary list  | Vocabulary   | See vocabulary list   | Vocabulary   | See vocabulary list  | Vocabulary   | See vocabulary list   |
| <b>Year 5</b>  |  |  |   |  |  |  |   |
| <b>Theme 1</b>   |  | <b>Theme 2</b>   |   | <b>Theme 3</b>   |  | <b>Theme 4</b>   |   |
| <b>Working scientifically</b>  | <b>Knowledge</b>   | <b>Working scientifically</b>  | <b>Knowledge</b>  | <b>Working scientifically</b>  | <b>Knowledge</b>   | <b>Working scientifically</b>  | <b>Knowledge</b>  |

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| <p><b>Taps:</b> Change of State cartoon</p> <p><b>Plan:</b> Explore changes in materials through a variety of investigations.<br/><b>Do:</b> Report and present findings including causal relationships and explanations in a cartoon format</p> <p>Explore how some changes result in the formation of new materials.<br/>Plan enquiries to test their predictions about changes in state and decide what observations, measurements etc. to take.<br/>Test results to ask further questions and to confirm results.</p> | <p><b>Properties and changes of materials</b><br/>Are you able to compare and classify materials by properties, including; transparency, hardness, solubility, conductivity, and response to magnets?<br/>Which materials dissolve to form a solution?<br/>How can you recover a substance from a solution?<br/>How can you separate materials in a solution?<br/>What are reversible and irreversible changes?<br/>What reasons are there, based on evidence from comparative and fair tests, for the particular use of everyday materials including wood, plastic and metals?</p> | <p><b>Taps:</b> Orbit explanation</p> <p><b>Plan:</b> Plan an enquiry, recognising and controlling variables.<br/><b>Do:</b> Describe the movement of the Earth in relation to the Sun<br/><b>Evaluate:</b> Use scientific language to communicate and justify their conclusions.</p> <p>Talk about how science has developed over time.</p> | <p><b>Earth and Space</b><br/>What are the movement of the earth and other planets, relative to the Sun in the solar system? What are the names of the planets in our solar system?<br/>What is the movement of the Moon relative to the Earth?<br/>Why do we have day time and night time? Why does the sun seem to move across the sky, rising in the East and setting in the West?</p> | <p><b>Taps:</b> Spinners</p> <p><b>Plan:</b> Plan an enquiry making their own decisions about what observations, measurements and tests to take.<br/><b>Do:</b> Recognise and control variables and decide how to record data<br/><b>Record:</b> As decided<br/><b>Evaluate:</b> Use test results to make predictions and to set up further tests</p> <p><b>Taps:</b> Marble run</p> <p><b>Plan:</b> Design options for a marble run<br/><b>Do:</b> Control variables fairly and accurately<br/><b>Record:</b> Changes made and timings<br/><b>Evaluate:</b> Annotate designs/finished model to label improvements made</p> | <p><b>Forces</b><br/>What are the effects of air resistance, water resistance and friction on moving surfaces?<br/>Why do some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect?<br/>Why do unsupported objects fall towards the Earth?</p> | <p><b>Taps:</b> Life cycle research</p> <p><b>Plan:</b> Research the life cycles of two different species<br/><b>Do:</b> Decide how to present their research using scientific language.<br/><b>Record:</b> Their findings<br/><b>Evaluate:</b> How effective was their presentation in sharing their findings.</p> | <p><b>Living things and their habitats</b><br/>What are the differences between the life cycles of a mammal, an amphibian, an insect and a bird?<br/>What is the life process of reproduction in some plants and animals?<br/>What are sexual and asexual reproduction?<br/><b>Animals including humans</b><br/>What are the changes as humans develop to old age? (Not to include anything to do with sex education or puberty)</p> |
| Vocabulary  | See vocabulary list   | Vocabulary   | See vocabulary list   | Vocabulary  | See vocabulary list  | Vocabulary  | See vocabulary list  |
| <b>Year 6</b>   |   |  |   |   |  |   |  |
| <b>Theme 1</b>  |   | <b>Theme 2</b>   |   | <b>Theme 3</b>  |  | <b>Theme 4</b>  |  |
| <b>Working scientifically</b>   | <b>Knowledge</b>  | <b>Working scientifically</b>  | <b>Knowledge</b>  | <b>Working scientifically</b>   | <b>Knowledge</b>   | <b>Working scientifically</b>   | <b>Knowledge</b>   |

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| <p><b>Taps:</b> Changing circuits</p> <p><b>Plan:</b> A variety of circuits<br/><b>Do:</b> Compare and give reasons for variations in how components function in circuits.<br/><b>Record:</b> Use scientific language and diagrams to report and present findings<br/><b>Evaluate:</b> Recognise why controlling variables is important and explain how and why.</p> <p><b>Taps:</b> Investigating shadows<br/><b>Plan:</b> Plan different kinds of fair experiments.<br/><b>Do:</b> Take repeated measurements when appropriate<br/><b>Record:</b> on a graph<br/><b>Evaluate:</b> Draw conclusions from results and describe causal relationships.</p> | <p><b>Electricity</b><br/>How does the number and voltage of cells affect the brightness of a lamp or the volume of a buzzer?<br/>What reasons can you give for variations in how components function including brightness of bulb, loudness of buzzer, on/off position of switches?<br/>What are the recognised symbols to represent a simple circuit in a diagram?</p> <p><b>Light</b><br/>How do we see things? (light travels from light sources to our eyes or from light sources to objects then to our eyes)<br/>What direction does light travel?<br/>Why do shadows have the same shape as the object that cast them?</p> | <p><b>Taps:</b> Fossil Habitats</p> <p><b>Plan:</b> Identifying scientific evidence that has been used to support or refute ideas or arguments<br/><b>Do:</b> Observe, discuss, explore ideas and ask questions.<br/>Use secondary sources to justify ideas and to research information.<br/><b>Evaluate:</b> Considers what can be known about appearance, habits and habitats from fossil evidence. Describes potential sources of error.</p> <p><b>Taps:</b> Adaptation</p> <p><b>Plan:</b> To investigate how animals adapt to their environment<br/><b>Do:</b> Research using secondary sources various animals. Choose at least one animal to draw and then to label how it has adapted to its environment<br/><b>Evaluate:</b> Consider how they may evolve in a different environment</p> | <p><b>Evolution and inheritance</b><br/>What information does a fossil provide? (information about living things that inhabited the Earth millions of years ago)<br/>Why have living things changed over time?<br/>Why is it that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents?<br/>How do living things change over time?<br/>How do animals and plants adapt to suit their environment?<br/>How does adaptation lead to evolution?</p> | <p><b>Do:</b> Use scientific language and labelled diagrams to describe the main parts of the human circulatory system.</p> <p><b>Do:</b> Classify animals and plants into appropriate groups<br/>Use previous knowledge and understanding of animals and plants to explore ideas and to raise questions</p> | <p><b>Animals including humans</b><br/>What are the main parts of the human circulatory system?<br/>What are the functions of the heart, blood vessels and blood?<br/><b>Living things and their habitats</b><br/>What broad groups are animals and plants, including micro-organisms, classified into?<br/>What are the reasons for classifying plants and animals in this way? (specific characteristics)</p> | <p><b>Taps:</b> Heartrate Headstands</p> <p><b>Plan:</b> A scientific enquiry to answer questions.<br/><b>Do:</b> Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.<br/><b>Record:</b> Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.<br/><b>Evaluate:</b> Test results to make predictions to set up further comparative and fair tests</p> | <p><b>Animals including humans</b><br/>What is the impact of diet, exercise, drugs and lifestyle on the way the body functions?<br/>What ways are nutrients and water transported within animals, including humans?<br/>What factors can affect heart rate and respiration?<br/>What are the stages on its journey around the body of an oxygen particle?</p> |
| <p><b>Vocabulary</b></p>   | <p>See vocabulary list</p>   | <p><b>Vocabulary</b></p>  | <p>See vocabulary list</p>   | <p><b>Vocabulary</b></p>   | <p>See vocabulary list</p>  | <p><b>Vocabulary</b></p>  | <p>See vocabulary list</p>  |