

## Science Progression

Science is a fundamental part of a child's world and their future place in it. Our curriculum aims to develop the knowledge, skills, processes and vocabulary of science. These key aspects of the science curriculum are built upon throughout a child's time at Greentrees from foundation stage, through Key Stage 1 and on to Key Stage 2.

|                                                        | EYFS                                                                                                           | Year 1                                                                                                                                                                                                                                                                                                                                                                                                                                           | Year 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Year 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Year 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Year 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Year 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| <b>Working Scientifically – disciplinary knowledge</b> |                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Plan</b>                                            | <p>Show curiosity and ask questions</p> <p>Make observations using senses and by making direct comparisons</p> | <p>With support, can ask simple questions that can be tested and begin to use scientific words to ask questions.</p> <p>Taught to use:<br/>How can we ....<br/>How does ....<br/>Which.....<br/>Is there a pattern...<br/>What are ....<br/>Do .....</p> <p>How is a bird different from an amphibian?</p> <p>Teach terms<br/>Observation over time<br/>Identifying, grouping, classifying, pattern seeking<br/>Research<br/>Problem solving</p> | <p><b>Ask simple questions and recognise that they can be answered in different ways showing some awareness of the types of enquiry.</b></p> <p>Can start a question<br/>How....<br/>How can we ....<br/>How does ....<br/>Which.....<br/>Is there a pattern...<br/>What are ....<br/>Do .....</p> <p>Have some understanding of the terms:<br/>Observation over time<br/>Identifying, grouping and classifying<br/>Pattern seeking<br/>Research<br/>Problem solving</p> | <p>With support, children can develop relevant, testable questions and show an awareness of the type of enquiry needed to answer it.</p> <p>More independence when identifying the types of enquiry:<br/>Observation over time<br/>Identifying, grouping, classifying, pattern seeking<br/>Research<br/>Problem solving</p> <p>Teach features of comparative and fair testing.<br/>How does the _____ affect the _____ ?<br/>To make my test fair I will....</p> <p>Begin to make predictions by saying what might happen in an investigation and why.<br/>Taught:<br/>I predict ..... because .....</p> | <p><b>Ask own, relevant questions, testable questions and use different types of scientific enquiries to answer them e.g comparative and fair testing.</b></p> <p>Understand features of: comparative / fair testing.<br/>research<br/>observation over time<br/>pattern seeking<br/>identifying, grouping and classifying<br/>problem solving</p> <p>Uses phrases independently:<br/>How does the _____ affect the _____ ?<br/>To make my test fair I will ...</p> <p>Make predictions independently<br/>I predict .. because ....<br/>I predict ... as a result of....<br/>This is likely because ....</p> | <p>Using own questions, begin to recognise the variables that are being tested (independent, dependent) and select the appropriate equipment for their tests.</p> <p>Teach in concepts: independent, dependent and controlled variables.</p> <p>Ind – thing testing<br/>Dep – measuring<br/>Controlled – things kept the same. Explain the effect of not keeping a test fair - reliability</p> <p>Make predictions and give a reason using scientific vocabulary showing an awareness of why this is important.</p> <p>To make my test fair, I will. I will do this because .....</p> | <p><b>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</b></p> <p>Recording variables independently</p> <p>The variables I will change/keep the same are... By doing this I expect.....</p> <p>Understand when planning why taking repeat readings are important for reliability.</p> <p>Make predictions and give a reason using scientific vocabulary. Base predictions on findings from previous investigations.</p> |

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| <b>Test</b>   | Can use simple equipment to measure or record observations by drawing, taking photographs, using sorting rings etc. | <p>Observe objects, materials and living things and describe what is seen noting key features.</p> <p>With support conduct simple tests</p> <p>Use simple, non standard equipment and measurements in a practical task.</p> | <p><b>Can perform simple tests showing an understanding of identifying classifying, pattern seeking and making observations over time.</b></p> <p><b>Can make observations using simple equipment correctly e.g. hand lenses, identification charts, metre stick</b></p> | <p>Make simple decisions about what to observe and perform simple practical enquiries.</p> <p>Make careful observations and take measurements using standard units related to the Yr 3 curriculum.</p> <p>Learn to use thermometers and data loggers</p>                                      | <p><b>Set up own simple practical enquiries, to perform comparative and fair tests.</b></p> <p><b>Make systematic and careful observations and, where appropriate, take accurate measurements using standard units related to the Yr 4 maths curriculum.</b></p> <p><b>Use a range of equipment, including thermometers and data loggers</b></p> | <p>Learn to identify the variables that need to be controlled and recognise the variables when performing tests.</p> <p>Take measurements, using a range of scientific equipment learning skills of accuracy and precision. e.g. ruler, tape measure or trundle wheel. Use a force meter with a suitable scale.</p> | <p><b>Conduct own tests using different types of scientific enquiries through own choice to answer questions, including recognising and controlling variables where necessary.</b></p> <p><b>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</b></p> |
| <b>Record</b> | Can use discussions and drawings to record ideas.                                                                   | <p>Record observations e.g. using photographs, videos, drawings, labelled diagrams</p> <p>Talk about findings</p>                                                                                                           | <p><b>Gather and record data to help in answering questions.</b></p> <p>Use prepared tables, pictograms, tally charts and block diagrams <b>(Yr 2 mathematical level)</b></p>                                                                                            | <p>Record observations and measurements using simple scientific language, photographs, videos, pictures, labelled diagrams or writing.</p> <p>Record measurements using tables - given templates, if required, to which they can add headings.</p> <p>Draw a bar chart to represent data.</p> | <p><b>Gather, record, classify and when appropriate present the same data in a variety of ways to help in answering questions.</b></p> <p><b>Record findings and classifications using simple scientific language, drawings, labelled diagrams, keys, bar charts, Carroll diagrams (Year 4)</b></p>                                              | <p>Decide how data and evidence can be best presented. Use annotated photographs, videos and observational drawings.</p> <p>Learn to record data and results of increasing complexity using scientific diagrams and labels, tables, graphs, bar and line graphs</p>                                                 | <p><b>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</b></p> <p><b>Independently use bar line and line graphs.</b></p> <p><b>Learn how to interpret scatter graph.</b></p>                                                            |

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|                                                                    |                                                                                             |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>mathematical level), and tables</p> <p>Draw own results table.<br/>Use Carroll diagrams<br/>Interpret line graph</p>                                                                                                                                                                                                                              | <p>Learn how to present data and interpret it as a line graph and bar line graph.</p>                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                      |
| <p><b>Answering questions and concluding</b></p>                   | <p>Use observations to help children talk about what they are doing and have found out.</p> | <p>Begin to use observations and ideas to suggest answers to questions, orally and in simple scaffolded sentences.</p> <p>Use experiences of the world around them to suggest appropriate answers to simple questions. They are supported to relate these to their evidence e.g. observations they have made, or information they have gained from secondary sources.</p> | <p><b>Use observations and ideas, to suggest appropriate answers to questions independently.</b></p> | <p>Present simple answers to a question based on observations they have made, measurements they have taken or information they have gained from secondary sources orally and in scaffolded written form.</p> <p>Comment verbally on whether their findings are consistent with the evidence.</p> <p>Supported to Identify differences, similarities or changes related to simple scientific ideas and processes.</p> | <p><b>Use results and evidence to draw simple conclusions and answer questions.</b></p> <p><b>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</b></p> <p><b>Identify differences, similarities or changes related to simple scientific ideas and processes</b></p> | <p>Present and report on findings from enquiries including, making conclusions, in oral and written form such as displays or other presentations.</p> <p>Learn to identify causal relationships and whether results can be trusted.</p> <p>Learn to identify whether scientific evidence supports or refutes ideas or arguments.</p> | <p><b>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.</b></p> <p><b>Identify scientific evidence that has been used to support or refute ideas or arguments.</b></p> |
| <p><b>Evaluate and raise further questions and predictions</b></p> |                                                                                             |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                      | <p>Identify ways in which a test has been adapted or how it could be done differently if an enquiry was repeated</p>                                                                                                                                                                                                                                                                                                 | <p><b>Following a test, make predictions for new values, suggest improvements and raise further questions.</b><br/>E.g use their evidence to suggest values for</p>                                                                                                                                                                                  | <p>Evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the</p>                                                                                                                                                                                                | <p>Use test results to make predictions to set up further comparative and fair tests</p>                                                                                                                                                                                                                                             |



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|                                          | <p>Talk about members of immediate family and community.</p> <p>Notice the differences between people.</p> | <p>Know the names of common animals that are fish, amphibians, reptiles, birds and mammals.</p> <p>Know the names of some animals that are carnivores, herbivores and omnivores</p> <p>Know the main body parts of fish, reptiles, amphibians, birds and mammals E.g. birds because all bird have wings.</p> <p>Identify, name, draw and label the basic parts of the human body - say which part of body is associated with each sense.</p> <p>Eyes – see<br/>Nose – smell<br/>Ears – hear<br/>Skin – touch<br/>Tongue - taste</p> | <p>Know that animals, including humans need water, food and air to survive.</p> <p>Know the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p>Know that animals, including humans, have offspring which grow into adults. E.g. kittens into cats, puppies into dogs and babies into adults.</p> | <p>Know that animals, including humans, can't make their own food and can name what types of food (in the main food groups) gives them the nutrition they need.</p> <p>Know that humans and some other animals have skeletons and muscles for support, protection and movement.</p> | <p>Know the simple functions of the basic parts of the digestive system in humans. Mouth, oesophagus, stomach, small intestine and large intestine.</p> <p>Know the different types of teeth in humans and their simple functions. Biting and Cutting, tearing and grasping, crush and grinding, chewing and grinding</p> | <p>Know the changes as humans develop into old age from a child, adolescent, adult to elderly.</p> | <p>Know the names of the main parts of the human circulatory system – heart, arteries, veins and blood</p> <p>Know the functions of the heart, blood vessels and blood</p> <p>Know the ways in which nutrients and water are transported within animals, including humans</p> |
| <b>Disciplinary knowledge – know how</b> |                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                           |                                                                                                    |                                                                                                                                                                                                                                                                               |
|                                          | <p>Make connections between the feature of their family</p>                                                | <p>Sort common animals into herbivores carnivores and omnivores based on their observations to answer simple</p>                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Use the basic principles of a healthy and varied diet to prepare dishes.</p>                                                                                                                                                                                                                                                                           | <p>Use knowledge of nutrition (food groups) to explain the importance of animals including humans eating food with a range of</p>                                                                                                                                                   | <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p>                                                                                                                                                                                                                        |                                                                                                    | <p>Know the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p>                                                                                                                                                                                |

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|                                         | <p>and other families.</p> <p>Know and talk about the different factors that support overall health</p> <p>teeth brushing</p> <p>sleep</p> <p>crossing roads</p> <p>physical activity</p> <p>food</p> | <p>questions. How do you know?</p>                                                                                  |                                                                                                                                                                                                                           | <p>nutrients for the activities we do, not just the food we like.</p>                                                     |                                                                                                                                                                                                          |                                                                                                                                                                                |                                                                                                                                                                                                            |
| <b>Vocabulary</b>                       | <p>head</p> <p>body</p> <p>eyes</p> <p>ears</p> <p>mouth</p> <p>teeth</p> <p>leg</p> <p>tail</p>                                                                                                      | <p>feathers</p> <p>fur</p> <p>beak</p> <p>taste</p> <p>tongue</p> <p>herbivore</p> <p>carnivore</p> <p>omnivore</p> | <p>offspring</p> <p>survive</p> <p>exercise</p> <p>heartbeat</p> <p>hygiene</p> <p>germs</p> <p>disease</p> <p>healthy</p>                                                                                                | <p>nutrition</p> <p>nutrients</p> <p>skeleton</p> <p>support</p> <p>protect</p> <p>skull</p> <p>joints</p> <p>muscles</p> | <p>digestion</p> <p>oesophagus</p> <p>intestine</p> <p>incisor</p> <p>canine</p> <p>producer</p> <p>predator</p> <p>prey</p>                                                                             | <p>puberty, the vocabulary to describe sexual characteristics in line with the school's RSE policy</p>                                                                         | <p>pulse</p> <p>blood vessels</p> <p>transported</p> <p>lungs</p> <p>veins</p> <p>oxygen</p> <p>carbon dioxide</p> <p>circulatory system</p>                                                               |
| <b>Living Things and their Habitats</b> |                                                                                                                                                                                                       |                                                                                                                     |                                                                                                                                                                                                                           |                                                                                                                           |                                                                                                                                                                                                          |                                                                                                                                                                                |                                                                                                                                                                                                            |
| <b>Substantive knowledge – know of</b>  |                                                                                                                                                                                                       |                                                                                                                     |                                                                                                                                                                                                                           |                                                                                                                           |                                                                                                                                                                                                          |                                                                                                                                                                                |                                                                                                                                                                                                            |
|                                         |                                                                                                                                                                                                       |                                                                                                                     | <p>Identify and name a variety of plants and animals in their habitats, including microhabitats.</p> <p>Know and compare the differences between things that are living, dead, and things that have never been alive.</p> |                                                                                                                           | <p>Know that living things can be grouped in a variety of ways and this is called classification.</p> <p>Know that environments can change and that this can sometimes pose dangers to living things</p> | <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p> | <p>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</p> |

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|                                   |  |  | Know 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. |  |                                                                                                                                      |                                                                                     |                                                                                   |
| Disciplinary knowledge – know how |  |  |                                                                                                                                                                                                                     |  |                                                                                                                                      |                                                                                     |                                                                                   |
|                                   |  |  | 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.                                                         |  | Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment |                                                                                     | Give reasons for classifying plants and animals based on specific characteristics |
| Vocabulary                        |  |  | suitable habitats survive conditions food chain air names of local plants and animals                                                                                                                               |  | classification classification keys environment habitat human impact positive negative vertebrate invertebrate                        | life cycle reproduce sexual sperm fertilises metamorphosis asexual runners cuttings | microorganisms virus bacteria fungi microhabitat taxonomy kingdoms Linnaean       |
| Plants                            |  |  |                                                                                                                                                                                                                     |  |                                                                                                                                      |                                                                                     |                                                                                   |
| Substantive knowledge – know of   |  |  |                                                                                                                                                                                                                     |  |                                                                                                                                      |                                                                                     |                                                                                   |

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|                                          | Describe what they see, hear and feel whilst outside.                                                                                                    | <p>Know the name of a variety of common wild and garden plants, including deciduous and evergreen trees on sight.</p> <p>Know the basic structure of a variety of common flowering plants, including trees.</p> | Know that plants are grown from seeds/bulb and need water and light for growth.                                                                                                         | <p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>Describe the way in which water is transported within plants.</p> <p>Know that different flowering plants require different conditions for growth.</p>                      |  |  |  |
| <b>Disciplinary knowledge – know how</b> |                                                                                                                                                          |                                                                                                                                                                                                                 |                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                          |  |  |  |
|                                          | <p>Explore the natural world around them.</p> <p>Begin to understand the need to respect and care for the natural environment and all living things.</p> | Sketch and label drawings to identify and describe the parts of a plant                                                                                                                                         | <p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> | <p>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>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p> |  |  |  |
| Vocabulary                               | <p>Oak</p> <p>Sycamore</p> <p>Chestnut</p> <p>Lime</p> <p>flower</p>                                                                                     | <p>evergreen</p> <p>deciduous</p> <p>blossom</p> <p>root</p> <p>trunk</p>                                                                                                                                       | <p>light</p> <p>shade</p> <p>warm</p> <p>cool</p> <p>healthy</p>                                                                                                                        | <p>Pollen</p> <p>insect/wind pollination,</p> <p>dispersal</p> <p>nutrients</p> <p>minerals</p>                                                                                                                                                                                                          |  |  |  |

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|                                   | leaf<br>fruit<br>plant | branch<br>seed<br>stem | bulb<br>germinate<br>shoot<br>seedling<br>soil | soil<br>absorb<br>transport                                                                                                                                         |  |  |                                                                                                                                                                                                                                                                                                        |
| Rocks, Evolution and Inheritance  |                        |                        |                                                |                                                                                                                                                                     |  |  |                                                                                                                                                                                                                                                                                                        |
| Substantive knowledge – know of   |                        |                        |                                                |                                                                                                                                                                     |  |  |                                                                                                                                                                                                                                                                                                        |
|                                   |                        |                        |                                                | Describe in simple terms that fossils are formed when things that have lived are trapped within rock<br><br>Know that soils are made from rocks and organic matter. |  |  | Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago<br><br>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents |
| Disciplinary knowledge – know how |                        |                        |                                                |                                                                                                                                                                     |  |  |                                                                                                                                                                                                                                                                                                        |
|                                   |                        |                        |                                                | Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties                                                 |  |  | Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution                                                                                                                                                                      |
| Vocabulary                        |                        |                        |                                                | fossil<br>layers<br>texture<br>minerals<br>organic<br>absorbs                                                                                                       |  |  | offspring<br>sexual reproduction<br>vary<br>characteristics, adapted<br>inherited<br>species<br>evolve / evolution                                                                                                                                                                                     |
| States of Matter and Materials    |                        |                        |                                                |                                                                                                                                                                     |  |  |                                                                                                                                                                                                                                                                                                        |

| Substantive knowledge – know of   |                                                                    |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                              |  |                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
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|                                   | <p>Know some of the processes and changes in the natural world</p> | <p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock</p> <p>Describe the simple physical properties of a variety of everyday materials, including waterproofness, absorbency, rough smooth, rigidity</p> | <p>Know that shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>                                             |  | <p>Understand the three states of matter and the terms evaporation and condensation</p>                                                                                  | <p>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</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>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> |  |
| Disciplinary knowledge – know how |                                                                    |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                              |  |                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
|                                   | <p>Make simple observations of materials</p>                       | <p>Compare and group together a variety of everyday materials based on their simple physical properties</p> <p>Explain which materials are selected for specific purposes</p>                                                                                                                                                               | <p>Identify and compare the suitability for particular uses, of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard</p> |  | <p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when they are heated</p> | <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating;</p> <p>Give reasons, based on evidence from comparative and fair</p>                                                                                                                                                                                                                                                                                                                                                       |  |

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|                                        |                                                                    |                                                                                                               |                                                                                                                                                                                        |                                                                                                                                  | <p>or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p> | <p>tests, for the particular uses of everyday materials, including metals, wood and plastic;</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes;</p> |  |
| <b>Vocabulary</b>                      | soft<br>hard<br>smooth<br>strong<br>weak<br>stiff<br>ice<br>frozen | material<br>waterproof<br>absorbent<br>see through<br>not see through<br>bendy<br>fabric<br>stretchy<br>rough | push/pushing<br>pull/pulling<br>twist/twisting<br>squash/squashing<br>stretch/stretching<br>opaque<br>transparent<br>translucent<br>reflective<br>non-reflective,<br>flexible<br>rigid |                                                                                                                                  | solid<br>liquid<br>gas<br>evaporation<br>condensation<br>water cycle<br>boiling point<br>melting point<br>freezing<br>heating<br>cooling                                                                                                          | dissolving<br>filtering<br>sieving<br>reversible<br>irreversible<br>thermal<br>soluble<br>insoluble<br>solution                                                                          |  |
| <b>Forces and Magnets</b>              |                                                                    |                                                                                                               |                                                                                                                                                                                        |                                                                                                                                  |                                                                                                                                                                                                                                                   |                                                                                                                                                                                          |  |
| <b>Substantive knowledge – know of</b> |                                                                    |                                                                                                               |                                                                                                                                                                                        |                                                                                                                                  |                                                                                                                                                                                                                                                   |                                                                                                                                                                                          |  |
|                                        |                                                                    |                                                                                                               |                                                                                                                                                                                        | <p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between 2 objects, but magnetic</p> |                                                                                                                                                                                                                                                   | <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p>                                           |  |

|                                   |  |  |  |                                                                                                                                                                                                                                                                 |  |                                                                                                                                                              |  |
|-----------------------------------|--|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                   |  |  |  | <p>forces can act at a distance</p> <p>Describe magnets as having 2 poles</p> <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing</p>                                                                            |  | <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p>                                               |  |
| Disciplinary knowledge – know how |  |  |  |                                                                                                                                                                                                                                                                 |  |                                                                                                                                                              |  |
|                                   |  |  |  | <p>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</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> |  | <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</p>                                   |  |
| Vocabulary                        |  |  |  | <p>force</p> <p>attract</p> <p>repel</p> <p>magnetic</p> <p>contact force</p> <p>non-contact force</p> <p>magnetic force</p> <p>north pole</p> <p>south pole</p>                                                                                                |  | <p>force</p> <p>gravity</p> <p>Earth</p> <p>air resistance</p> <p>water resistance, friction</p> <p>mechanisms</p> <p>levers</p> <p>pulleys</p> <p>gears</p> |  |
| Earth and Space                   |  |  |  |                                                                                                                                                                                                                                                                 |  |                                                                                                                                                              |  |

| Substantive knowledge – know of   |                                                                              |  |  |                                                                                                  |  |                                                                                                                                                                                    |                                                                                                                   |
|-----------------------------------|------------------------------------------------------------------------------|--|--|--------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|                                   | Sun, Moon, Earth, star, planet, sky, day, night, space, round, bounce, float |  |  |                                                                                                  |  | Describe the sun, Earth and moon as approximately spherical bodies<br><br>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun Earth |                                                                                                                   |
| Disciplinary knowledge – know how |                                                                              |  |  |                                                                                                  |  |                                                                                                                                                                                    |                                                                                                                   |
|                                   |                                                                              |  |  |                                                                                                  |  | Describe the movement of the Earth and other planets relative to the sun in the solar system<br><br>Describe the movement of the moon relative to the Earth                        |                                                                                                                   |
| Vocabulary                        |                                                                              |  |  |                                                                                                  |  | spherical rotation / rotate solar system orbit names of planets                                                                                                                    |                                                                                                                   |
| Light                             |                                                                              |  |  |                                                                                                  |  |                                                                                                                                                                                    |                                                                                                                   |
| Substantive knowledge – know of   |                                                                              |  |  |                                                                                                  |  |                                                                                                                                                                                    |                                                                                                                   |
|                                   |                                                                              |  |  | Recognise that light from the sun can be dangerous and that there are ways to protect their eyes |  |                                                                                                                                                                                    | Recognise that light appears to travel in straight lines<br><br>Use the idea that light travels in straight lines |

|                                   |  |  |  |                                                                                                                                                                                                                                      |  |  |                                                                                                                                                                                                                                   |
|-----------------------------------|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   |  |  |  | Know that light is needed to see things and that dark is the absence of light.                                                                                                                                                       |  |  | to explain that objects are seen because they give out or reflect light into the eye<br><br>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 |
| Disciplinary knowledge – know how |  |  |  |                                                                                                                                                                                                                                      |  |  |                                                                                                                                                                                                                                   |
|                                   |  |  |  | <p>Notice that light is reflected from surfaces.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>Find patterns in the way that that the size of shadows change</p> |  |  | Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them                                                                                                        |
| Vocabulary                        |  |  |  | <p>light</p> <p>shadows</p> <p>mirror</p> <p>reflective / reflection</p> <p>light source</p> <p>cast</p> <p>surface</p> <p>absence</p>                                                                                               |  |  | <p>straight lines</p> <p>light rays</p> <p>plus recap Year 3 vocabulary</p>                                                                                                                                                       |
| Sound                             |  |  |  |                                                                                                                                                                                                                                      |  |  |                                                                                                                                                                                                                                   |
| Substantive knowledge – know of   |  |  |  |                                                                                                                                                                                                                                      |  |  |                                                                                                                                                                                                                                   |

|                                          |                                                                                                                                                                                                |  |  |  |                                                                                                                                                                                                                                                                                                                    |  |  |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|                                          | sound, noise,<br>listen, hear,<br>music,<br>voices, bird<br>song, traffic,<br>sirens,<br>thunder,<br>high, low,<br>loud, quiet,<br>soft, volume,<br>crackle,<br>thunder,<br>hum, buzz,<br>roar |  |  |  | Identify how sounds<br>are made, associating<br>some of them with<br>something vibrating<br><br>Recognise that<br>vibrations from sounds<br>travel through a<br>medium to the ear                                                                                                                                  |  |  |
| <b>Disciplinary knowledge – know how</b> |                                                                                                                                                                                                |  |  |  |                                                                                                                                                                                                                                                                                                                    |  |  |
|                                          |                                                                                                                                                                                                |  |  |  | Find patterns between<br>the pitch of a sound<br>and features of the<br>object that produced it<br><br>Find patterns between<br>the volume of a sound<br>and the strength of the<br>vibrations that<br>produced.<br><br>Recognise that sounds<br>get fainter as the<br>distance from the<br>sound source increases |  |  |
| <b>Vocabulary</b>                        |                                                                                                                                                                                                |  |  |  | sound<br>source<br>vibrate, vibration<br>pitch (high, low),<br>volume                                                                                                                                                                                                                                              |  |  |

|                                          |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                            |
|------------------------------------------|--|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          |  |  |  |  | faint<br>insulation                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                                                                                            |
| <b>Electricity</b>                       |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                            |
| <b>Substantive knowledge – know of</b>   |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                            |
|                                          |  |  |  |  | <p>Identify common appliances that run on electricity</p> <p>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</p> <p>Know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> |  | <p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p> |
| <b>Disciplinary knowledge – know how</b> |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                            |
|                                          |  |  |  |  | <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors</p>                                                                                               |  | <p>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</p>                                  |

**Vocabulary**

electricity  
appliance  
mains  
non-metal  
component  
circuit  
conductor  
insulator

circuit diagram  
circuit symbol  
complete circuit  
cell  
battery  
bulb  
buzzer  
motor  
switch  
voltage