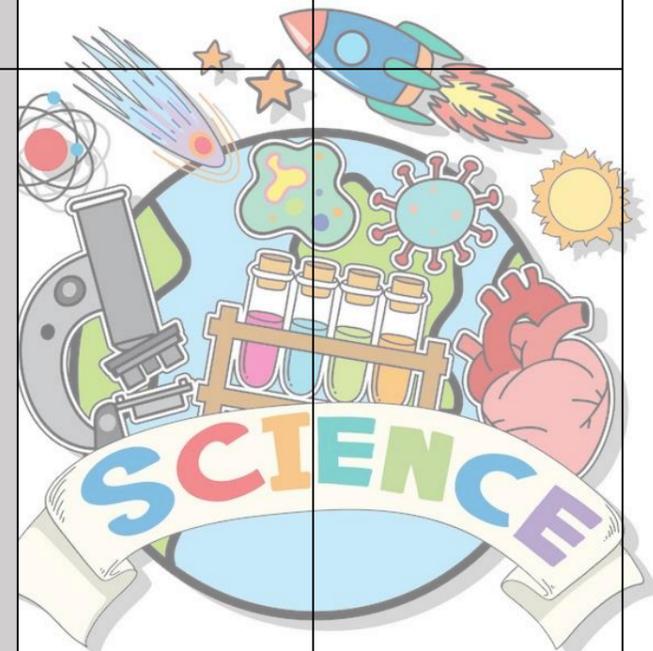
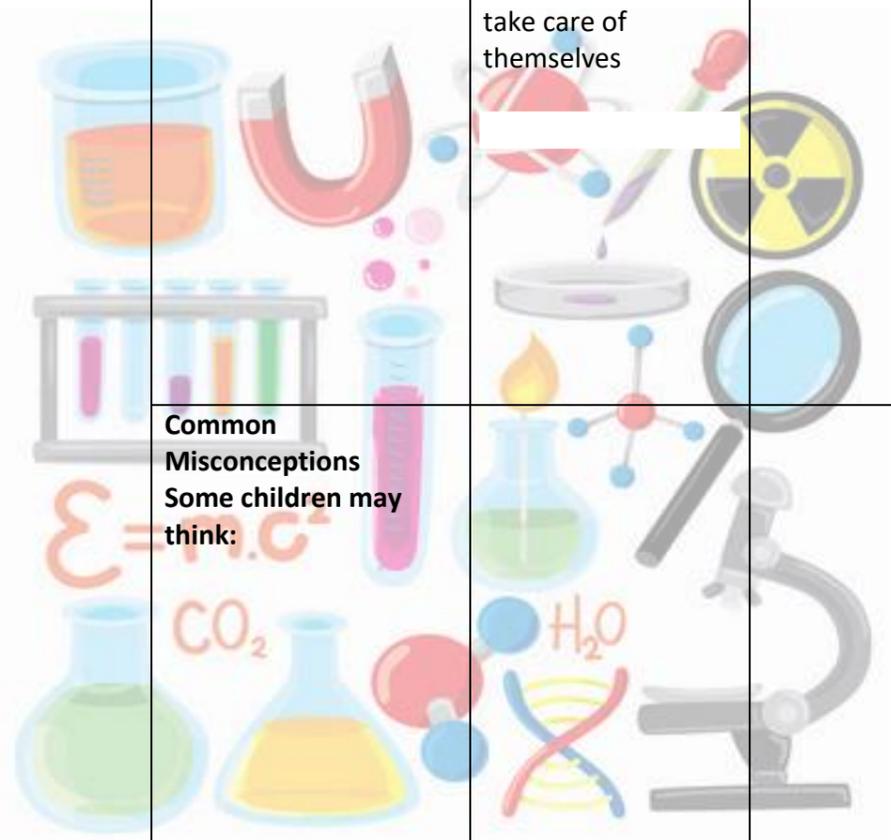


|   | Reception  | Year 1  | Year 2  | Year 3   | Year 4 | Year 5                                      | Year 6   |
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| <p><b>Life processes</b></p> <p>Survival of living things<br/>Knowledge</p> | <p>Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Learn about how to take care of themselves</p> | <p>Different animals need different types of food</p> | <p>Some things are living, some are dead and some have never been alive.</p> <p>Animals need water, food and air<br/>To stay healthy animals need exercise, a balanced diet and hygiene</p> <p>Plants need water, light and warmth.</p> | <p>Identify that animals, including humans, need the right types and amount of nutrition and they cannot make their own food – they get nutrition from what they eat.</p> <p>To stay healthy plants need light, water, nutrients and room to grow</p>  |        | <p>Plants and animals need to reproduce</p> | <p>Some substances and lifestyle choices can have a negative impact on health – recognise the impact of drugs, vapes, alcohol and cigarettes on the body.</p> <p>Learn about the work of Sir Richard Doll in relation to the link between smoking and health problems.</p> |
| <p><b>Common Misconceptions</b><br/>Some children may think:</p>            |  |   | <ul style="list-style-type: none"> <li>Plants and seeds are not alive as they cannot be seen to move</li> <li>Fire is living</li> </ul>   | <ul style="list-style-type: none"> <li>Certain whole food groups like “fats” are bad for you</li> <li>Specific foods, like cheese, are also “bad” for you</li> <li>Diet and fruit drinks are “good” for you</li> <li>Plants eat food</li> <li>Food comes from the soil via the roots</li> <li>Flowers are merely decorative rather than a vital part of the life cycle in reproduction</li> <li>Plants only need sunlight to keep them warm</li> </ul> |        |   |  |



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|  |  |   |   | <ul style="list-style-type: none"> <li>• Roots suck in water which is then sucked up the stem</li> </ul>  |   |  |  |
| <p><b>Structure and function of plants, animals and humans</b><br/>Knowledge</p> | <p>Understand how to plant seeds and how to care for plants and animals.</p> <p>To explore the natural world around them, making observations and drawing pictures of plants and animals</p> | <p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>Describe and compare the structure of a variety of common animals (fish amphibians, reptils, birds and mammals, including pets)</p> <p>Identify, name, draw and label the basic parts of the human body and say which part is associated with each sense.</p> | <p>All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive.</p> | <p>Many animals, including humans, have skeletons and muscles for support, protection and movement</p> <p>Different parts of flowering plants have different functions : Roots and stems – nutrition, transport of water and support, Leaves – nutrition Flowers – reproduction</p> | <p>Animals and humans have teeth to help them eat.</p> <p>Food is broken down further in the stomach and intestine and absorbed into the blood stream with water</p>  |  | <p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels, and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p> |
| <p><b>Common Misconceptions</b><br/><b>Some children may think:</b></p>          |  | <ul style="list-style-type: none"> <li>• That plants are flowering plants grown in pots with coloured petals, leaves and a stem.</li> <li>• Trees are not plants</li> <li>• All leaves are green</li> <li>• A trunk is not a stem</li> <li>• Blossom is not a flower</li> </ul>   | <ul style="list-style-type: none"> <li>• Respiration is breathing</li> <li>• Breathing is respiration</li> </ul>                          | <ul style="list-style-type: none"> <li>• Snakes are similar to worms, so they must also be invertebrates</li> <li>• Invertebrates have no form of skeleton</li> </ul>   | <ul style="list-style-type: none"> <li>• Your stomach is where your belly button is</li> <li>• Food is digested only in the stomach</li> <li>• When you have a meal, your food goes down one tube and your drink goes down another</li> <li>• The food you eat becomes “poo” and the drink becomes “wee”</li> </ul> |  | <ul style="list-style-type: none"> <li>• Your heart is on the left side of your chest</li> <li>• The heart makes blood</li> <li>• The blood travels in one loop from the heart to the lungs and then around the body</li> <li>• When we exercise, our heart beats faster to work the muscles more</li> <li>• Some blood in our bodies is</li> </ul>      |

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|   |  |   |   |  |  |  | <p>red and some is blue</p> <ul style="list-style-type: none"> <li>• We just eat food for energy</li> <li>• All fat is bad for you</li> <li>• All dairy is good for you</li> <li>• Protein is good for you so you can eat as much as you want</li> <li>• Foods only contain fat if you can see it</li> <li>• All drugs are bad for you</li> </ul> |
| <p><b>Classification</b></p> <p>Knowledge</p>                       | <p>Children name and identify living things.</p> <p>Desscribe people who are familiar to them.</p> <p>Name and describe animlas that live in different habitats.</p> <p>Describe different habitats.</p> | <p>Plants and animals can be grouped using observable features</p> <p>Identify and name a variety of common animals. (fish, amphibians, reptiles, birds, mammals)</p> <p>Identify and name common animals that are carnivores, herbivores and omnivores. bb</p> <p>Plants are grouped into common wild and garden plants, deciduous and evergreen trees</p> | <p>Animals and plants can be identified and grouped. This is linked to habitats.</p>  |  | <p>Plants and animals can be grouped using a wider range of characteristics</p> <p>Keys are used for the identification of animals and plants.</p> |  | <p>Describe how living things ar classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.</p> <p>Give rasons for classifying plants and animlas based on their specific characteristics.</p>   |
| <p><b>Common Misconceptions</b></p> <p>Some children may think:</p> |  | <ul style="list-style-type: none"> <li>• Only 4 legged mammals, such as pets are animals</li> <li>• Humans are not animals, insects are not animals</li> <li>• All “bugs” or “creepy crawlies” such as spiders, are part of mthe insect group</li> </ul>  | <ul style="list-style-type: none"> <li>• an animals habitat is like it’s “home”</li> <li>• all animlas that live in the sea are fish</li> </ul> |  | <ul style="list-style-type: none"> <li>• animals are only land living animals</li> </ul>   |  | <ul style="list-style-type: none"> <li>• All micro-organisms are harmful</li> <li>• Mushrooms are plants</li> </ul>   |

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|   |   | <ul style="list-style-type: none"> <li>amphibians and reptiles are the same</li> </ul> |   |  |   |   |  |
| <p><b>Life cycles</b></p> <p>Knowledge</p>  | <p>Understand the key features of life cycles of plants and animals.</p>  |  | <p>Plants: seeds and bulbs grow into plants.</p> <p>Animals, including humans, reproduce offspring which grow into adults</p>   |  |   | <p>Life cycles differ for different species.</p> <p>Plants can reproduce asexually.</p> <p>Describe the changes as humans develop to old age</p>  |  |
| <p><b>Common Misconceptions</b></p> <p>Some children may think:</p>                         |   |  | <ul style="list-style-type: none"> <li>seeds and bulbs need sunlight to germinate</li> <li>seeds are not alive</li> <li>all plants start out as seeds</li> <li>plants are not alive as they cannot be seen to move</li> </ul>   |  |   | <ul style="list-style-type: none"> <li>all plants start out as seeds</li> <li>All plants have flowers</li> <li>Plants that grow from bulbs do not have seeds</li> <li>Only birds lay eggs</li> <li>a bay grows in a mother's tummy</li> <li>A baby is "made"</li> </ul>                                 |  |
| <p><b>Interdependence</b></p> <p>All living things are interdependent.</p> <p>Knowledge</p> | <p>Know some similarities and differences between plants and animals in the natural world around them and contrasting environments, drawing on their experiences.</p> |  | <p>Different plants and animals live in different places to which they are suited – by giving them food and shelter.</p> <p>Animals get their food from plants and other animals and in turn are consumed by other animals.</p> |  | <p>Nutrients made by plants move to primary consumers and then to secondary consumers through food chains</p> | <p>Living things have changed over time.</p> <p>Gain and understanding of Darwin's theory of evolution by natural selection.</p> <p>How animals and plants have adapted to their environment in order to survive.</p> <p>Understand the evolution of different species including whales and humans.</p> |  |

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| <p><b>Common misconceptions</b><br/>Some children may think:</p> |  |  | <ul style="list-style-type: none"> <li>• an animals habitat is like it's home</li> <li>• arrows in a food chain mean "eats"</li> </ul> |  | <ul style="list-style-type: none"> <li>• the death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain</li> <li>• There is always plenty of food for wild animals</li> <li>• Animals and plants can adapt to their habitats, however they change</li> </ul> |  |   |
| <p><b>Evolution and Inheritance</b></p>                          |  |  |  |  |  |  | <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> |
| <p><b>Common Misconceptions</b><br/>Some children may think:</p> |  |  |  |  |  |  | <ul style="list-style-type: none"> <li>• Adaptation occurs during an animals lifetime: giraffes necks stretch during their</li> </ul>   |

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|  |  |   |  |   |   |  | <p>lifetime to reach higher leaves and animals living in cold environments grow thick fur during their life.</p> <ul style="list-style-type: none"> <li>• Offspring most resemble their parents of the same sex.</li> <li>• All characteristics, including those that are due to actions during their parents' life such as dyed hair or footballing skills, can be inherited</li> <li>• Cavemen and dinosaurs were alive at the same time</li> </ul> |
| <p><b>Materials</b></p> <p>Describing and using materials.<br/>Knowledge</p> |  | <p>Distinguish between an object and the material it is made from.</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.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple properties.</p> | <p>Different materials are suitable for different uses (properties that can be observed)</p> | <p>There are different materials and they are used to make different objects.</p> | <p>Compare and group materials together, according to whether they are solids, liquids or gases..</p> | <p>Different properties make materials suitable for different uses (properties that can be measured). Materials can be sorted into groups according to properties including hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.</p> |   |

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| <p><b>Common Misconceptions</b><br/>Some children may think:</p> |   | <ul style="list-style-type: none"> <li>• Only fabrics are materials</li> <li>• Only building materials are materials</li> <li>• Only writing materials are materials</li> <li>• The word rock describes an object rather than a material</li> <li>• “solid” is another word for hard</li> </ul> | <ul style="list-style-type: none"> <li>• Only fabrics are materials</li> <li>• Only building materials are materials</li> <li>• Only writing materials are materials</li> <li>• The word rock describes an object rather than a material</li> <li>• Solid is another word for hard</li> </ul> |  | <ul style="list-style-type: none"> <li>• “solid” is another word for hard or opaque</li> <li>• Solids are hard and cannot break or change shape easily and are often in one piece</li> <li>• Substances made of very small particles like sand or sugar cannot be solids</li> <li>• Particles in liquids are further apart than in solids and they take up more space</li> <li>• When air is pumped into balloons they become lighter</li> </ul> |   |  |
| <p><b>Changing materials</b><br/>Knowledge</p>                   | <p>Talk about the differences between materials and changes they notice when materials change state.</p> <p>Explore a range of materials, including natural materials. Make objects from different materials, including natural materials. Observe, measure and record how materials change</p> |   | <p>The shape of some solid materials can be changed by a contact force acting on them</p>   |  | <p>Some materials change state when heated or cooled, and measure or research the temperature at which this happens in degrees Celcius.</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>   | <p>Some materials will dissolve in a liquid</p> <p>Dissolving, mixing and changes of state are reversible changes</p> <p>Changes including baking, burning and the reaction of certain chemicals result in new materials</p> <p>Changes that result in new materials are not usually reversible</p> |  |

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|  | when heated and cooled.<br>Compare how materials change over time and in different conditions. |  |  |  |   |  |  |
| <b>Common Misconceptions</b><br>Some children may think: |  |  |  |  | <ul style="list-style-type: none"> <li>• Steam is visible water vapour ( only the condensing droplets can be seen)</li> <li>• Melting, as a change of state, is the same as dissolving</li> <li>• all liquids boil at the same temperature 100 degrees</li> <li>• water in different forms – steam, water, ice – are all different substances.</li> </ul> | <p>Lots of misconceptions exist around reversible and irreversible changes, including around the permanance or impermanence of the change. There is confusion between physical/chemical changes and reversible/irreversible changes. They do not correlate simply. Chemical changes result in a new material being formed. These are mostly irreversible. Physical changes are often reversible but may be permanent. These do not result in new materials e.g. cutting a loaf of bread, it is still bread, but it is no longer a loaf. The shape, but not the material has been changed.</p> <p>Some children may think:</p> <ul style="list-style-type: none"> <li>• thermal insulators keep cold in or out</li> <li>• thermal insulators</li> </ul> |  |

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|  |  |  |  |  |  | warm things up   |  |
| <b>Mixing and separating materials</b><br>Knowledge      |  |  |  |  |  | Mixtures can be separated by filtering, sieving and evaporating  |  |
| <b>Common Misconceptions</b><br>Some children may think: |  |  |  |  |  | <ul style="list-style-type: none"> <li>solids dissolved in liquids have vanished and so you cannot get them back</li> <li>Lit candles only melt, which is a reversible change</li> </ul> |  |
| <b>Rocks</b><br>Knowledge                                |  |  |  | Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.<br>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.<br>Recognise that soils are made from rocks and organic matter.       |  |  |  |
| Common misconceptions<br>Some children may think:        |  |  |  | <ul style="list-style-type: none"> <li>Rocks are all hard in nature</li> <li>Rock-like, man made substances such as concrete or brick are rocks</li> <li>Materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer "natural"</li> </ul> |  |  |  |

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|  |                                       |                      |  | <ul style="list-style-type: none"> <li>• Certain artefacts, like old bits of pottery or coins are fossils</li> <li>• A fossil is an actual piece of the extinct animal or plant</li> <li>• Soil and compost are the same thing</li> </ul>  |  |  |  |
| <b>Light Knowledge</b>                                   | Explore shadows.<br>Explore rainbows. | We see with our eyes |  | <p>We need light to see things, darkness is the absence of light<br/>Notice that light is reflected from surfaces.<br/>Recognise that light from the sun can be dangerous and that there are ways to protect the eyes.<br/>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.<br/>Find patterns in the way that the size of shadows change</p> |  |  | <p>Recognise that light appears to travel in straight lines.<br/>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.<br/>Explain that we see things because light travels from light sources to our eyes or from light sources to objects to objects and then to our eyes.</p> |
| <b>Common Misconceptions</b><br>Some children may think: |                                       |                      |  | <ul style="list-style-type: none"> <li>• we can still see even when there is an absence of any light</li> <li>• our eyes "get used to" the dark</li> <li>• the moon and other reflective surfaces are light sources</li> <li>• a transparent object is a light source</li> <li>• shadows contain details of the object, such as facial features on their own shadow</li> </ul>                   |  |  | <ul style="list-style-type: none"> <li>• we see objects because light travels from our eyes to the object</li> </ul>   |

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|  |   |                       |  | <ul style="list-style-type: none"> <li>• shadows result from objects giving off darkness</li> </ul> |  |  |  |
| <b>Sound Knowledge</b>                                   | Listen to sounds outside and identify the source.<br>Make sounds. | We hear with our ears |  |   | <p>Sounds are made when something vibrates</p> <p>Sounds get fainter the further they are from the source</p> <p>The volume of a sound can be changed</p> <p>The pitch of a sound can be changed</p>   |  |  |
| <b>Common Misconceptions</b><br>Some children may think: |   |                       |  |   | <ul style="list-style-type: none"> <li>• pitch and volume are frequently confused, both can be described as high or low.</li> <li>• Sound is only heard by the listener</li> <li>• Sound only travels in one direction from the source</li> <li>• Sound can't travel through liquids and solids</li> </ul> <p>High sounds are loud, low sounds are quiet</p> |  |  |
| <b>Electricity Knowledge</b>                             |   |                       |  |   | <p>Electrical appliances need a source of electricity to work</p> <p>A complete circuit is needed for an electric current to flow</p> <p>A circuit is made up of different components</p> <p>A switch opens and closes a circuit</p> <p>Some materials are better conductors</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>Compare and give reasons for variations in how components</p> |

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|   |   |  |  |   | than others  |   | function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.<br><br>Use recognized symbols when representing a simple circuit in a diagram.  |
| Common Misconceptions<br>Some children may think: |   |  |  |   | <ul style="list-style-type: none"> <li>• Electricity flows to bulbs, not through them</li> <li>• Electricity flows out of both ends of a battery</li> <li>• Electricity works by simply coming out of one end of a battery into the component</li> </ul> |   | <ul style="list-style-type: none"> <li>• Larger sized batteries make bulbs brighter</li> <li>• A complete circuit uses up electricity</li> <li>• Components in a circuit that are closer to the battery get more electricity</li> </ul> |
| <b>Forces Knowledge</b>                           | <p>Explore and talk about different forces they can feel.</p> <p>Explore how to change how things work.</p> <p>Explore how the wind can move objects.</p> <p>Explore how objects move in water.</p> |  | Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. | <p>Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract or repel each other and attract some materials but not others.</p> <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>Drag forces resist movement (air resistance, water resistance, friction)</p> <p>The force of gravity caused by the Earth pulls objects towards its centre</p> <p>Some mechanisms (like levers, pulleys and gears) allow a smaller force to have a greater effect</p> |   |

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|   |  |   |  | Describe magnets as having two poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing. |  |   |  |
| Common Misconceptions<br>Some children may think: |  |   |  | <ul style="list-style-type: none"> <li>the bigger the magnet the stronger the force</li> <li>all metals are magnetic</li> </ul>        |  | <ul style="list-style-type: none"> <li>the heavier the object, the faster it falls</li> <li>Forces act in pairs which are equal or opposite</li> <li>Smooth surfaces have no friction</li> <li>Objects always travel better on smooth surfaces</li> <li>A moving object has a force which is pushing it forwards and it stops when the pushing force wears out</li> <li>A non-moving object has no forces acting on it</li> <li>Heavy objects sink and light objects float</li> </ul> |  |
| <b>Earth in space</b><br>Knowledge                | Play and explore outside in all seasons and in different weather | Observe changes across the four seasons.<br>Observe and describe weather associated with the seasons and how day length varies. |  |  |  | The Earth, Sun and Moon are approximately spherical<br>The Earth is one of eight planets that orbit the Sun   |  |

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|   | <p>To notice the changing seasons and to begin to understand the effect of changing seasons on the natural world around them.</p> <p>Learn about the Earth, Sun, Moon, planets and stars.</p> <p>Learn about space travel</p> |   |   |  |  | <p>The Earth orbits the Sun once every year<br/>The Earth rotates on its own axis once every 24 hours<br/>The Moon orbits the Earth and looks different at different times of the month<br/>It is due to the rotation of the earth that we experience day and night</p>   |  |
| <p>Common Misconceptions<br/>Some children may think:</p> |   | <ul style="list-style-type: none"> <li>• It always snows in winter</li> <li>• It is always sunny in summer</li> <li>• There are only flowers in the spring and summer</li> <li>• It rains most of the winter</li> </ul>   |   |  |  | <ul style="list-style-type: none"> <li>• The Earth is flat</li> <li>• The Sun is a planet, the Sun rotates around the Earth</li> <li>• The Sun moves across the sky during the day</li> <li>• The sun rises in the morning and sets in the evening</li> <li>• The moon only appears at night</li> <li>• Night is caused by the moon getting in the way of the Sun, or the Sun moving further away from the Earth</li> </ul> |  |
| <b>Approaches to enquiry</b>                              | Through the children's knowledge and  | <p><b>Children should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including:</b></p> <ul style="list-style-type: none"> <li>• observing changes over a period of time</li> </ul> | <p><b>Children should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them including:</b></p> | <p><b>Children should select the most appropriate ways to answer science questions using different types of scientific enquiry, including:</b></p> |  |   |  |

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|                         | <p>understanding of the world they will:</p> <ul style="list-style-type: none"> <li>• Observe and talk about any similarities and differences they notice in the world around them</li> <li>• Start to identify and classify living things</li> <li>• Use reading materials including electronic sources of information to find things out</li> </ul> | <ul style="list-style-type: none"> <li>• noticing patterns</li> <li>• grouping and classifying things</li> <li>• carrying out simple comparative tests</li> <li>• finding things out using secondary sources of information</li> </ul>  | <ul style="list-style-type: none"> <li>• observing changes over time</li> <li>• noticing patterns</li> <li>• grouping and classifying things</li> <li>• carrying out simple fair tests</li> <li>• finding things out using secondary sources of information</li> </ul>   | <ul style="list-style-type: none"> <li>• observing changes over different periods of time</li> <li>• noticing patterns</li> <li>• grouping and classifying things</li> <li>• carrying out fair tests</li> <li>• finding things out using a wide range of secondary sources of information</li> </ul>  |
| <b>Asking questions</b> | <p>Children are encouraged to be curious and through their experiences of the world around them, are encouraged to ask their own questions.</p> <p>Children explore and ask questions about how things work.</p>  | <p><b>Ask simple questions</b></p> <ul style="list-style-type: none"> <li>• Begin to shape questions using different question stems</li> <li>• Ask questions about how and why objects, materials and living things: <ul style="list-style-type: none"> <li>o change</li> <li>o are similar or different to each other</li> <li>o connect with each other</li> <li>o are made or work</li> </ul> </li> <li>• Suggest questions to investigate</li> </ul>  | <p><b>Ask relevant questions</b></p> <ul style="list-style-type: none"> <li>• Recognise questions that can be investigated scientifically and those that cannot</li> <li>• Ask a clear scientific question</li> <li>• Recognise when questions can be answered by first hand or second sources of evidence</li> </ul>  | <p><b>Use results to raise further questions</b></p> <ul style="list-style-type: none"> <li>• Independently ask questions and offer ideas for scientific enquiry</li> </ul> <p><b>Use test results to make predictions to set up further comparative and fair tests</b></p>   |
| <b>Planning</b>         | <p>Children are guided to make sense of the world around them and why things behave or work the way they do. They are supported to answer their own questions about the world.</p>  | <p><b>Recognise that questions can be answered in different ways</b></p> <ul style="list-style-type: none"> <li>• With support: <ul style="list-style-type: none"> <li>o Suggest how to find things out</li> <li>o Identify changes to observe and measure</li> <li>o Identify patterns to observe and measure</li> <li>o Identify variables to change and measure</li> <li>o Identify sorting criteria</li> <li>o Suggest how to take measurements</li> <li>o Suggest next steps or a sequence of steps in a plan</li> </ul> </li> </ul> | <p><b>Use different types of scientific enquiries to answer them</b></p> <ul style="list-style-type: none"> <li>• identify different ways to answer a question</li> <li>• Choose the most appropriate method</li> </ul> <p><b>Set up simple practical enquiries, comparative and fair tests</b></p> <ul style="list-style-type: none"> <li>• Decide what observations to make, how often and what equipment to use</li> <li>• Decide what measurements to take, how long to make them for and whether to repeat them</li> <li>• Decide what sorting or classification criteria to use</li> <li>• Recognise when a simple fair test is necessary</li> </ul> | <p><b>Plan different types of scientific enquiries to answer questions</b></p> <ul style="list-style-type: none"> <li>• Explain why an enquiry method is the most appropriate to answer a question</li> <li>• Plan systematic collection of data and which equipment to use</li> <li>• Plan collection of sufficient data</li> <li>• Recognise when research using secondary sources will answer questions</li> <li>• Decide which sources of information to use to answer questions</li> </ul> <p><b>Recognise and control variables where necessary</b></p> |

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|                        |  |   | <ul style="list-style-type: none"> <li>• With help, decide what variables to change and measure</li> </ul>  | <ul style="list-style-type: none"> <li>• Recognise when variables need to be controlled and why</li> <li>• Recognise when variables cannot be controlled and a pattern seeking enquiry is appropriate</li> <li>• Identify which variables have the greatest effect on the result</li> </ul>  |
| <b>Collecting Data</b> | <p>Children observe closely using simple equipment.</p> <p>Children use non-standard units to collect information.</p> <p>Children sort objects by observable and behavioural features and make comparisons. Children use a variety of sources such as reading books, electronic sources, first hand observation and practical activities to answer their questions.</p> | <p><b>Observe closely, using simple equipment</b></p> <ul style="list-style-type: none"> <li>• Choose and use appropriate simple equipment to make observations</li> <li>• Use non-standard units to collect observations</li> </ul> <p><b>performing simple tests</b></p> <ul style="list-style-type: none"> <li>• Choose and use appropriate simple equipment with increasing accuracy to collect comparative data</li> <li>• Use non-standard units to collect data</li> </ul> <p><b>identifying and classifying</b></p> <ul style="list-style-type: none"> <li>• Sort objects by observable and behavioural features</li> <li>• Make comparisons between simple features</li> </ul> <p><b>gathering data to help in answering questions</b></p> <ul style="list-style-type: none"> <li>• Gather data to answer questions from a variety of sources including talking to people, simple books and electronic media, first hand observation and practical activity</li> </ul> | <p><b>Make systematic and careful observations where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</b></p> <ul style="list-style-type: none"> <li>• Use a range of equipment including data loggers to collect data using standard measures</li> <li>• With support take accurate measurements on measuring equipment, recognising when to repeat them</li> <li>• Carry out simple tests to sort and classify materials according to properties or behaviour</li> </ul> <p><b>Gather data in a variety of ways to help in answering questions</b></p> <ul style="list-style-type: none"> <li>• Gather data to answer questions from a variety of sources including using textbooks, simple keys, electronic media, first hand observation, practical activity and data collected by others</li> </ul> | <p><b>Take measurements, using a range of scientific equipment with increasing accuracy and precision</b></p> <ul style="list-style-type: none"> <li>• Use a range of equipment accurately without support to collect observations and measurements</li> <li>• Repeat sets of observations or measurements, where appropriate, selecting suitable ranges and intervals</li> <li>• Use a series of tests to sort and classify materials</li> <li>• Use relevant information and data from a range of secondary sources to answer questions</li> </ul> |
| <b>Presenting Data</b> | <p>Children talk about what they have found out and use drawings and emerging writing to communicate their ideas. They use physical objects and sorting hoops to sort materials and objects. They are guided to use simple</p>   | <p><b>Record data to help in answering questions</b></p> <ul style="list-style-type: none"> <li>• Talk about what has been found out and how</li> <li>• Record observations in word and pictures</li> <li>• Record observations and test results in simple prepared pictograms, tables, tally charts, bar charts and maps including ICT formats</li> <li>• Record sorting in sorting circles or tables</li> </ul>   | <p><b>Record data in a variety of ways to help in answering questions</b></p> <ul style="list-style-type: none"> <li>• Make notes</li> <li>• Record data in tables and bar charts</li> <li>• Use graphs produced by data loggers</li> </ul> <p><b>Classify in a variety of ways to help in answering questions</b></p> <ul style="list-style-type: none"> <li>• Use Carroll diagrams, and Venn diagrams to classify</li> <li>• Use and make simple keys to identify and classify</li> </ul>   | <p><b>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs and models</b></p> <ul style="list-style-type: none"> <li>• Decide how to record data accurately and appropriately</li> <li>• Use appropriate scientific language in oral and written presentations</li> <li>• Make keys and branching databases with 4 or more items</li> <li>• Use more than one source of scientific evidence to identify and classify things</li> </ul>                         |

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|                   | tally charts to present basic data.   |  | <p><b>Present data in a variety of ways to help in answering questions</b></p> <ul style="list-style-type: none"> <li>• Drawings, labelled diagrams</li> <li>• Bar charts, bar line graphs, simple scatter graphs and tables using ICT where appropriate</li> </ul>  | <ul style="list-style-type: none"> <li>• Present data in line graphs, scatter graphs and frequency charts</li> </ul>  |
| <b>Concluding</b> | <p>Children use their developing vocabulary to talk about information, processes, changes and ideas.</p> <p>Children talk about any similarities and differences that they have observed.</p> <p>Children start to make links with their own experiences of the world around them and basic scientific ideas and processes.</p> | <p><b>Use their observations and ideas to suggest answers to questions</b></p> <ul style="list-style-type: none"> <li>• Use simple scientific language to talk about observation or findings</li> <li>• Use results to answer the investigation question</li> <li>• Identify simple changes</li> <li>• Sequence changes</li> <li>• Say whether the change was expected</li> <li>• Identify similarities and differences</li> <li>• Make simple comparisons</li> <li>• Make links between two sets of observations</li> <li>• Identify simple patterns and talk about them</li> <li>• Say whether the pattern was expected</li> <li>• Identify simple causal relationships</li> <li>• Say if the relationship was expected</li> </ul> | <p><b>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</b></p> <ul style="list-style-type: none"> <li>• Draw simple conclusions about changes observed and link these to scientific ideas</li> <li>• Refer to a table or graph when reporting findings</li> <li>• Begin to use and interpret graphs produced by data loggers</li> <li>• Draw a simple conclusion about similarities and differences identified and link these to scientific ideas</li> <li>• Draw conclusions about simple patterns between two sets of data</li> <li>• Draw simple causal conclusions from fair tests</li> <li>• Draw conclusions from data from different secondary sources</li> </ul> <p><b>Identify differences, similarities or changes related to simple scientific ideas and processes</b></p> <ul style="list-style-type: none"> <li>• Make links between: <ul style="list-style-type: none"> <li>o observed changes</li> <li>o similarities and differences</li> <li>o simple patterns between two sets of data</li> <li>o simple causal relationships</li> <li>o data from secondary sources</li> </ul> </li> <li>• and simple scientific ideas and processes</li> </ul> <p><b>Use straightforward scientific evidence to answer questions or to support their findings</b></p> <p>Refer to evidence from practical tests and observations or from secondary data sources when answering questions or explaining findings</p> <ul style="list-style-type: none"> <li>• Use simple scientific language in a range of oral and written presentations suitable for different audiences to present findings</li> </ul> | <p><b>Report and present findings from enquiries, including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations</b></p> <ul style="list-style-type: none"> <li>• Use scientific evidence to answer questions or support findings</li> <li>• Draw valid conclusions about changes, similarities and differences, and causal relationships from data collected</li> <li>• Draw valid conclusions that utilise more than one piece of supporting evidence</li> <li>• Use scientific knowledge to explain findings</li> <li>• Use simple models to help describe scientific ideas</li> <li>• Explain differences in repeated observations or measurements, identifying reasons for any anomalies noticed</li> </ul> <p><b>Communicate findings in written form, displays, multi-media and other forms of presentation using scientific language</b></p> |
| <b>Evaluating</b> |   | <ul style="list-style-type: none"> <li>• Say whether data was useful</li> <li>• Say whether an information source was useful</li> </ul> <p>Give an opinion about some further information</p>  | <p><b>Use results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions</b></p>   | <p><b>Identify scientific evidence that has been used to support or refute ideas or arguments</b></p> <ul style="list-style-type: none"> <li>• Begin to separate opinion from fact</li> <li>• Use scientific evidence to justify ideas</li> </ul>   |

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|  |  |  |   | <ul style="list-style-type: none"> <li>• Make predictions for new values within or beyond the collected data collected</li> <li>• Identify new questions arising from the data</li> <li>• Find ways of improving enquiries</li> </ul>  | <ul style="list-style-type: none"> <li>• Talk about how scientific ideas have developed over time</li> </ul> <p>Identify when further tests and observations might be needed</p> <p>Evaluate the effectiveness of their working methods, making practical suggestions for improving them</p>  |  |
| <b>Working Scientifically Vocabulary</b> | Look closely, observe, watch, touch, feel, smell, listen, same, different, compare, ask questions, record, sort, group | Observe, changes, patterns, grouping, sorting, compare, same, different, identify (name) measure, data, record results, drawing, picture, table, tally chart, present, pictogram, block chart, Venn diagram, ask questions, test, investigate, explore, equipment, resources, magnifying glass, hand lens, ruler, tape measure, metre stick, pipette, syringe, spoon, teaspoon, answer questions, interpret results, scientific enquiry, pattern seeking, comparative testing, observing over time, classifying, researching using secondary sources.                  |   | Practical work, fair testing, relationships, accurate, thermometer, data logger, stopwatch, timer, estimate, data, diagram, identification key, chart, bar chart, prediction, similarity, difference, evidence, information, findings, criteria, values, properties, characteristics, conclusion, explanation, reason, evaluate, improve | Variables, independent variables, dependent variable, control variable, evidence, justify, argument (science), causal relationship, accuracy, precision, scatter graphs, bar graphs, force meter  |  |
| <b>Key Vocab- Autumn</b>                 |  | <p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area ( including but not limited to: oak, holly, apple, pear, ash etc) names of garden and wild flowering plants in the local area ( including but not limited to: daisy, dandelion, strawberry, rose, lavender, daffodil, tulip) utilise the school grounds and sunshine garden.</p> <p><i>Autumn, spring, summer, winter</i></p> <p>Weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder,</p> | <p>Question, answer, observe, sort, classify, equipment, group, record, chart, compare, contrast, describe, investigate</p> <p>Names of materials – wood, plastic, metal, glass, brick, rock, paper, cardboard</p> <p>Properties of materials – as for Y1 plus opaque, transparent, and translucent, reflective, non-reflective, flexible, rigid</p> <p>Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing. Bend/bending, stretch/stretching</p> <p>Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival, names of world habitats ( including but</p> | <p>Rock, stone, pebble, boulder, grain, granite, crystals, layers, hard, soft, texture, absorb water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, soil, types of soil ( peaty, clay, sandy)</p> <p>Light, light source, Sun, sunlight, dangerous, shadow, opaque, translucent, transparent</p>              | <p>Sound, source, vibrate, vibration, travel, pitch (high, low) volume, faint, loud, insulation</p> <p>Electricity, electrical appliance/device, mains, plug, electrical circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal.</p> <p>NB. the children do not need to use the standard symbols for electrical components, this is Y6.</p> | <p>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p> <p>Evolution, offspring, sexual reproduction, vary, key characteristics, suited, adapted, environment, inherited, species, fossils, evolve, evolution</p> |

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|                         |  | lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day, length  | not limited to: ocean, desert, rainforest etc) names of local habitats (including but not limited to: pond, woodland etc) names of micro-habitats ( including but not limited to: under log, in a bush etc) conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro habitats studied.  |  |   |   |   |
| <b>Key Vocab Spring</b> |  | Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card, cardboard, rubber, wool,, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbant, breaks, tears, rough, smooth, shiny, dull, see-through, not see-through | Question, answer, observe, sort, classify, equipment, group, record,chart,compare,contrast, describe, investigate<br><br>Offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animls and their babies (including but not limited to chick/hen, kitten/cat, caterpillar/butterfly) survive, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types ( eg. Meat, fish, vegetables, bread, rice, pasta, dairy) | Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole | Solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle.<br><br>Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain | Life Cycle, reproduce, sexual, fertilises, asexual, plantlets, runners, tubers, bulbs<br><br>Puberty – the vocabulary to describe sexual characteristics (link to PSHRE policy) | As for Y3 Light, plus light rays, straight lines<br><br>Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle |
| <b>Key Vocab Summer</b> |  | Head, bosy, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals experienced   | Question, answer, observe, sort, classify, equipment, group, record,chart,compare,contrast, describe, investigate   | Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, musckles,  | Classification, classification keys, environment, habitat, human impact, migration, hibernation   | Force, gravity, earth, air resistance, friction, mechanisms, simple, machines, levers, pulleys, gears   | <ul style="list-style-type: none"> <li>• Circuit, complete circuit, circuit diagram, circuit</li> </ul>   |

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|  |  | <p>first hand from each vertebrate group, parts of the body<br/>(linked to PSHRE policy)<br/>senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ear, tongue</p> <p><i>The children need to be able to name and identify a range of animals in each group eg. Name specific birds and fish. They do not need to use the terms mammal and reptile etc. The children do not need to use the words carnivore, herbivore and omnivore. If they do however, ensure they understand that carnivores eat each other, not just meat.</i></p> | <p>Light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling, root, seed, bulb, fruit, vegetables, herbs</p> | <p>joints, support, protect, move, skull, ribs, spine</p> <p>Photosynthesis, pollen, insect/wind pollination, male, female, seed formation, (wind dispersal, water dispersal) air, nutrients, minerals, soil, absorb, transport.</p> |  | <p>Sun, Moon, Earth, planets ( Mercury, Venus, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit</p> | <p>symbol, cell, battery, bulb, buzzer, motor, switch, voltage</p> <p>NB. Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.</p> <p>Vertbrates, fish, amphibians, reptiles, birds, mammals, invertebrates, warm-blooded, cold-blooded, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers.</p> |
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