Time Allocation 2 hours per week – STEM week normally in Block 4.

The Glapton Academy
A L.E.A.D. Academy

# Science Progression

| Early Years - FS1 & 2 | | | |
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| **Understanding the World (The World)**<br>Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes. | | **Physical Development (Health and Self-Care)**<br>Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe. | |
| **F1**<br>**Working Scientifically** | • Finding ways to solve problems<br>• Making predictions<br>• Testing their ideas<br>• Developing ideas around grouping.<br>• Developing ideas around sequencing.<br>• How to use grouping and sequencing.<br>• Planning and making decisions about how to approach a task.<br>• Checking how well an activity is developing.<br>• To think about what they want to change | **F2**<br>**Working Scientifically** | • Finding ways to solve problems<br>• Making predictions<br>• Testing their ideas<br>• Developing ideas around grouping.<br>• Developing ideas around sequencing.<br>• How to use grouping and sequencing.<br>• Planning and making decisions about how to approach a task.<br>• Checking how well an activity is developing.<br>• To think about what they want to change. |
| **Plants** | • They verbally make observations of plants. | **Plants** | • They verbally make observations of plants and talk about what has happened and the changes that have occurred. |
| **Living things and their habitats** | • Children know about similarities and differences in relation to objects and materials.<br>• They can talk about the features in their immediate environment. | **Living things and their habitats** | • Children know about similarities and differences in relation to places, objects, materials and living things<br>• They can talk about the features of their immediate environment and how environments might vary to one another. |
| **Animals including humans** | • To observe the effects of physical activity on their bodies.<br>• To show care and concern for living things and the environment.<br>• To eat a healthy range of foodstuffs. | **Animals including humans** | • To observe the effects of physical activity on their bodies.<br>• To show care and concern for living things and the environment how to collect them safely and return them safely.<br>• To eat a healthy range of foodstuffs and understand a need for variety in food.<br>• To show some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health. |
| **Seasonal Changes** | • Talk about similarities and differences to the four seasons. | **Seasonal Changes** | • Talk about similarities, differences, patterns and changes in relation to the four seasons. |

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| **Materials, States of Matter and Rocks** | • Children know about similarities and differences in relation to, objects, materials and living things.<br>• They can make observations and identify when something is changing and make predictions of why it has changed.<br>• They can talk about how materials feel, smell, move, sound and look like. | **Materials, States of Matter and Rocks** | • Children know about similarities and differences in relation to places, objects, materials and living things.<br>• They can make observations and explain why some things have changed and talk about those changes. (Bubbles etc)<br>• They know the properties of some materials and can suggest how it might be used.<br>• To develop an understanding of growth, decay and changes over time. |
| **Forces, Earth and Space** | • Develop ideas of grouping, sequencing and the causes in relation to movement i.e. toys, cars, rough surfaces etc.<br>• They know the properties of some materials and can suggest how it might be used.<br>• They are familiar with basic scientific concepts such as floating and sinking. | **Forces, Earth and Space** | • Develop ideas of grouping, sequencing and the causes in relation to movement i.e. toys, cars, rough surfaces etc.<br>• They know the properties of some materials and can suggest how it might be used.<br>• They are familiar with basic scientific concepts such as floating and sinking. |

Below are the strands and learning expectations for KS1 and KS2.

If you see red text in a strand it shows the learning links to other topics and other year groups that should support you when doing concept maps.

At the very bottom is the learning for KS3 which will help Year 6 with their concept maps.

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# Key Stage 1 and 2

| Strands | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| **Working Scientifically** | Asking Questions | **Asking simple questions and recognising that they can be answered in different ways.**<br><br>While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions.<br><br>The children answer questions developed with the teacher often through a scenario.<br><br>The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered. | **Asking simple questions and recognising that they can be answered in different ways.**<br><br>While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions.<br><br>The children answer questions developed with the teacher often through a scenario.<br><br>The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered. | **Asking relevant questions and using different types of scientific enquiries to answer them.**<br><br>The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions.<br><br>The children answer questions posed by the teacher.<br><br>Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question. | **Asking relevant questions and using different types of scientific enquiries to answer them.**<br><br>The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions.<br><br>The children answer questions posed by the teacher.<br><br>Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question. | **Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry.**<br><br>Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.<br><br>The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample. | **Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry.**<br><br>Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.<br><br>The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample. |

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| | Measuring and Recording | **Observing closely using simple equipment.**<br><br>Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations.<br><br>They begin to take measurements, initially by comparisons, then using non-standard units.<br><br>**Performing simple tests**<br><br>The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.<br><br>**Identifying and Classifying** | **Observing closely using simple equipment.**<br><br>Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations.<br><br>They begin to take measurements, initially by comparisons, then using non-standard units.<br><br>**Performing simple tests**<br><br>The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.<br><br>**Identifying and Classifying** | **Setting up simple practical enquiries, comparative and fair tests**<br><br>The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher.<br><br>**Explanatory note**<br>A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome.<br><br>A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.<br><br>They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.<br><br>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions<br><br>Recording findings using simple scientific language, | **Setting up simple practical enquiries, comparative and fair tests**<br><br>The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher.<br><br>**Explanatory note**<br>A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome.<br><br>A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.<br><br>They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.<br><br>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions<br><br>Recording findings using simple scientific language, | **Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.**<br><br>The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale.<br><br>During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).<br><br>**Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.**<br><br>The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. | **Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.**<br><br>The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale.<br><br>During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).<br><br>**Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.**<br><br>The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. |

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| | | Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting.<br><br>They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing. | Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting.<br><br>They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing. | drawings, labelled diagrams, keys, bar charts, and tables.<br><br>The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams.<br><br>Children are supported to present the same data in different ways in order to help with answering the question. | drawings, labelled diagrams, keys, bar charts, and tables.<br><br>The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams.<br><br>Children are supported to present the same data in different ways in order to help with answering the question. | Children present the same data in different ways in order to help with answering the question. | Children present the same data in different ways in order to help with answering the question. |
| | Concluding | **Gathering and recording data to help answering questions**<br><br>The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing.<br><br>They record their measurements e.g. using prepared tables, pictograms, tally charts and bar charts.<br><br>They classify using simple prepared tables and sorting rings. | **Gathering and recording data to help answering questions**<br><br>The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing.<br><br>They record their measurements e.g. using prepared tables, pictograms, tally charts and bar charts.<br><br>They classify using simple prepared tables and sorting rings. | **Using straightforward scientific evidence to answer questions or to support their findings.**<br><br>Children answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.<br><br>**Identifying differences, similarities or changes related to simple** | **Using straightforward scientific evidence to answer questions or to support their findings.**<br><br>Children answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.<br><br>**Identifying differences, similarities or changes related to simple** | **Identifying scientific evidence that has been used to support or refute ideas or arguments.**<br><br>Children answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific | **Identifying scientific evidence that has been used to support or refute ideas or arguments.**<br><br>Children answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific |

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| | | **Using observations and ideas to suggest answers to questions.**<br><br>Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources.<br><br>The children recognise 'biggest and smallest', 'best and worst' etc. from their data. | **Using observations and ideas to suggest answers to questions.**<br><br>Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources.<br><br>The children recognise 'biggest and smallest', 'best and worst' etc. from their data. | **scientific ideas and processes**<br><br>Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships. | **scientific ideas and processes**<br><br>Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships. | understanding, supports or refutes their answer.<br><br>They talk about how their scientific ideas change due to new evidence that they have gathered.<br><br>They talk about how new discoveries change scientific understanding.<br><br>**Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**<br><br>Children answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. | understanding, supports or refutes their answer.<br><br>They talk about how their scientific ideas change due to new evidence that they have gathered.<br><br>They talk about how new discoveries change scientific understanding.<br><br>**Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.**<br><br>Children answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. |
| | Evaluation | | | **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** | **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** | They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the | They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the |

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| | | | | Draw conclusions based on their evidence and current subject knowledge.<br><br>Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.<br><br>Use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface.<br><br>Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.<br><br>**Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**<br><br>They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary. | Draw conclusions based on their evidence and current subject knowledge.<br><br>Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.<br><br>Use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface.<br><br>Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.<br><br>**Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**<br><br>They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary. | credibility of secondary sources used.<br><br>They communicate their findings to an audience using relevant scientific language and illustrations.<br><br>**Using test results to make predictions to set up further comparative and fair tests.**<br><br>Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests. | credibility of secondary sources used.<br><br>They communicate their findings to an audience using relevant scientific language and illustrations.<br><br>**Using test results to make predictions to set up further comparative and fair tests.**<br><br>Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests. |

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| **Plants**<br>**Biology** | **Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.**<br><br>**Identify and describe the basic structure of a variety of common flowering plants, including trees.**<br><br>**Pupils should: use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables they have planted.**<br><br>**Working Scientifically by:**<br>**Observing closely.**<br>**Comparing and Contrasting**<br>**Identify and group.**<br>**Drawing diagrams.**<br>**Keep records of changes over time.** | Observe and describe how seeds and bulbs grow into mature plants.<br><br>**Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.**<br><br>**Pupils should: Use their local environment throughout the year to observe how different plants grow.**<br><br>**Be introduced to the requirements of germination, growth and survival, as well as reproduction and growth in plants.**<br><br>**Working Scientifically by:**<br>**Observing and recording, with some accuracy, the growth of a variety of plants as they change over time from seed or bulb.**<br><br>**Observing similar plants during different stages of growth.**<br>**Set up comparative tests – plants need light, water to stay healthy.** | **Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. See Vocabulary to list a full plant.**<br><br>**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.**<br><br>**Investigate the way in which water is transported within plants**<br><br>**Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.**<br><br>**Pupils should: Be introduced to the relationship between structure and function; the idea that every part has a job to do.**<br><br>They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.<br><br>**Working Scientifically by:**<br>**Comparing the effect of different factors on** | Recognise that living things can be grouped in a variety of ways<br>(Living things and their habitats)<br><br>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment<br>(Living things and their habitats)<br><br>Recognise that environments can change and that this can sometimes pose a danger to living things<br>(Living things and their habitats) | Describe the life process of reproduction in some plants and animals<br>(Living things and their habitats) | 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.<br>(Y6 Living things and their habitats) |

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| | | | **plant growth (the amount of light/fertiliser).**<br><br>**Observing the plant life cycle.**<br><br>Look at patterns in the structure of fruit and how they then disperse.<br><br>**How water is transported in plants.** | | | |
| Subject Knowledge | **Key vocabulary**<br>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud<br><br>Names of trees in the local area.<br><br>Names of garden and wild flowering plants in the local area.<br><br>Growing locally there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant.<br><br>Plants have common parts but they vary between the different types of plants.<br><br>Deciduous and Evergreen Some trees keep their leaves all year whilst other trees drop their leaves during autumn and grow them again during spring. | **Key Vocabulary**<br>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud<br><br>**As well as Year 1 vocabulary:**<br>light, shade, sun, warm, cool, water, grow, healthy<br><br>Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc.<br><br>Seeds and bulbs need to be planted outside at particular times of the year and they will germinate and grow at different rates.<br><br>Some plants/bulbs are better suited to growing in full sun and some grow | **Key vocabulary**<br>Year 2 and Photosynthesis, pollen, stamen, stigma, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal<br><br>Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place.<br><br>The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. | | | |

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| | | better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.<br><br>**Note**<br>Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them. | Some plants produce flowers which enable the plant to reproduce.<br><br>Pollen, which is produced by the male part of the flower (Stamen), is transferred to the female part (stigma) of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways.<br><br>Different plants require different conditions for germination and growth. | | | |
| **Animals including Humans Biology**<br><br>**DFE Priority Nutrition**<br><br>**RSE Physical Health and Fitness** | **Animals**<br>**Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals**<br><br>identify and name a variety of common animals that are carnivores, herbivores and omnivores<br><br>**describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)**<br><br>**Pupils should: use the local environment throughout the year to explore and answer** | **Nutrition – Physical Health and Fitness**<br>**Notice that animals, including humans, have offspring which grow into adults**<br><br>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)<br><br>**Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.**<br><br>**Pupils should:** be **introduced to the basic needs of animals for survival. As well as the importance of exercise** | **Nutrition**<br>**Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food;**<br><br>**Identify that humans get nutrition from what they eat.**<br><br>**Identify that humans and some other animals have skeletons and muscles for support, protection and movement.**<br><br>**Pupils should: continue to learn the importance of nutrition and should be introduced to the main body parts associated with the skeleton,** | Describe the simple functions of the basic parts of the digestive system in humans<br><br>**Identify the different types of teeth in humans and their simple functions**<br><br>**Construct and interpret a variety of food chains, identifying producers, predators and prey.**<br><br>**Pupils should: be introduced to the many body parts associated with the digestive system. Explore questions that help them understand their special functions.** | **Describe the changes as humans develop to old age.**<br><br>**(This builds on the learning in Living things and there.**<br><br>**Pupils should: Draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty.**<br><br>**Working Scientifically by:** researching the gestation periods of other animals and comparing them with humans. | **Nutrition – Physical Health and Fitness**<br>**Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.**<br><br>**Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.**<br><br>Describe the ways in which nutrients and water are transported within animals, including humans.<br><br>**Pupils should: build on learning from Year 3 and 4 about the main body parts and internal organs.** |

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| | **questions about animals in their habitat.**<br><br>**Understand how to take care of animals taken from the local area and how to return them safely.**<br><br>**Humans**<br>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense<br><br>**Pupils should:**<br>Have plenty of opportunities to learn the names of the main body parts.<br><br>**Working Scientifically by**: Observations to compare and contrast animals at first hand or through videos and photographs.<br><br>Describing how they identify and group them.<br><br>Using senses to compare different textures, sounds and smells. | **and nutrition for humans.**<br><br>**Introduced to the processes of reproduction and growth in animals.**<br><br>Ask questions about to recognise growth but not expected to understand how reproduction occurs.<br><br>**Working Scientifically by:** Observing through video or first-hand observation or measurement how different animals including humans grow.<br><br>Ask questions about what things animals need for survival.<br><br>Ask questions about what humans need to be healthy and suggest ways to find out the answers to their questions. | **muscles, finding out different parts of the body have special functions.**<br><br>**Working Scientifically by: Identifying and grouping animals with and without skeletons (invertebrates) and observing and comparing their movement. Exploring what would happen if humans didn't have skeletons.**<br><br>**Compare and contrast diets of different animals and group them depending on what they eat.**<br><br>**They might research different food groups and why they are healthy or unhealthy. Creating a healthy meal.** | **Working Scientifically by:** Comparing teeth of carnivores and herbivores and suggesting why they are different.<br><br>**Finding out what damages teeth and how to look after them.**<br><br>**They might draw and discuss their ideas about the digestive system and compare these with models and images.** | | **Skeletal, Muscular and Digestive system).**<br><br>**Explore questions that they might have about the circulatory system.**<br><br>**Working Scientifically by:** Exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health. |
| Subject Knowledge | **Key Vocabulary Animals & Humans**<br>Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves | **Key Vocabulary**<br>Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), | **Key Vocabulary**<br>Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, | **Key Vocabulary**<br>Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, | **Key Vocabulary**<br>Puberty: the vocabulary to describe sexual characteristics<br><br>When babies are young they grow rapidly. They are very dependent on | **Key Vocabulary**<br>Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, |

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| | Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them.<br>Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals.<br><br>**Note**<br>The children also do not need to use the words carnivore, herbivore and omnivore. If they do, ensure that they understand that carnivores eat other animals not just meat.<br><br>**Key Vocabulary Humans**<br>Senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue.<br><br>NB. Although we often use our fingers and hands to feel objects the children should understand that we can feel with many parts of our body.<br><br>Humans have keys parts in common, but these vary from person to person. Humans (and other animals) find out about the world using their senses. | Exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)<br><br>Animals including humans have offspring which grow into adults. In humans and some animals these offspring will be young, such as babies or kittens, that grow into adults.<br><br>In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults.<br><br>The young of some animals do not look like their parents e.g. tadpoles.<br><br>All animals including humans have basic needs of feeding, drinking and breathing that must be satisfied in order to survive, and to grow into healthy adults they also need the right amounts and types of food and exercise.<br><br>Good hygiene is also important in preventing infections and illnesses. | move, skull, ribs, spine, muscles, joints.<br><br>Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need.<br><br>Food contains a range of different nutrients that are needed by the body to stay healthy – carbohydrates including sugars, protein, vitamins, minerals, fibre, fat, sugars, water. A piece of food will often provide a range of nutrients.<br><br>Humans and some other animals have skeletons and muscles which help them move and provide protection and support. | premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain.<br><br>Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball.<br><br>The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added.<br><br>The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body.<br><br>The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body.<br><br>What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet.<br><br>Humans have four types of teeth - incisors for cutting, canines for tearing, molars and | their parents. As they develop they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce. | diet, exercise, drugs and lifestyle.<br><br>The heart pumps blood in the blood vessels around to the lungs.<br><br>Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body.<br><br>Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed.<br><br>As they are used they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system.<br><br>Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel.<br><br>Some conditions are caused by deficiencies in |

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| | Humans have five senses sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body. | | | premolars for grinding (chewing).<br><br>Living things can be classified as producers, predators and prey according to their place in the food chain. | | our diet e.g. lack of vitamins. |
| **Year 1 Everyday materials**<br><br>**Year 2 Uses of everyday materials**<br><br>**Year 5 Properties and changes of materials**<br><br>**DFE Priority Materials – Substance**<br><br>**DFE Priority Properties and changes of materials** | **Materials Properties**<br>**Distinguish between an object and the material from which it is made**<br><br>**Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock**<br><br>**Describe the simple physical properties of a variety of everyday materials.**<br><br>**Compare and group together a variety of everyday materials on the basis of their simple physical properties.**<br><br>**Pupils should: Explore, name, discuss, raise and answer questions about everyday materials and their properties.**<br><br>**Working Scientifically by:** Performing simple tests to explore questions. Which is the best material for an umbrella? For the lining of a dog basket? Etc. | **Materials Properties**<br>**Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.**<br><br>**Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.**<br><br>**Pupils should: Identify and discuss the uses of different everyday materials.**<br><br>**Know that materials can be more than one thing. Metal – coins, cars, cans.**<br><br>**To know that objects can be made from the same materials. i.e. spoon- plastic, wood, metal.**<br><br>**To think about materials that suitable and** | Magnetic Properties<br>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Rock)<br><br>Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Rock)<br><br>Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Forces and Magnets) | | **Substance & Reactions Properties and changes of materials**<br>**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.**<br><br>**To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution**<br><br>**Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.**<br><br>**Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.** | |

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| | | **unsuitable for everyday use.**<br><br>To find out about people who developed different materials i.e. John Dunlop, Charles Macintosh.<br><br>**Working Scientifically by: Comparing the uses of everyday materials in and around the school, home, journeys, visits.**<br><br>Observing closely, identifying and classifying the uses of different materials, and recording their observations. | | | **Demonstrate that dissolving, mixing and changes of state are reversible changes.**<br><br>**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.**<br><br>**Pupils should: Explore a systematic understanding of materials by exploring a broad range of materials including those explored in magnetism in Year 3 and electricity in Year 4.**<br><br>**Explore reversible change and non-reversible changes. Reversible – evaporating, sieving, melting and dissolving. Non-reversible – burning rusting etc.**<br><br>**Find out about how chemists create new materials.**<br><br>**Working Scientifically by: carrying out tests to answer questions: Which materials would be the most effective for a winter coat.** | |

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| | | | | | **You might use materials to make a switch.**<br><br>**They could observe and compare the changes that take place, for example when burning different materials or baking bread or cakes.**<br><br>They might research and discuss how chemical changes have an impact on our lives i.e. cooking.<br><br>**They could discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.** | |
| Subject Knowledge | **Key vocabulary**<br>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, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through<br><br>All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc. | **Key vocabulary**<br>Names of materials – wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay.<br><br>Properties of materials - as for year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing. Bend/bending, stretch/stretching.<br><br>All objects are made of one or more materials that are chosen specifically because they | | | **Key Vocabulary**<br>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non-reversible change, burning, rusting, new material<br><br>Materials have different uses depending on their properties and state (liquid, solid, gas).<br><br>Properties include hardness, transparency, electrical and thermal | |

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| | Some materials e.g. plastic can be in different forms with very different properties. | have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water.<br><br>When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities.<br><br>A material can be suitable for different purposes and an object can be made of different materials.<br><br>Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc.<br><br>This can be a property of the material or depend on how the material has been processed e.g. thickness. | | | conductivity and attraction to magnets.<br><br>Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. Mixtures can be separated by filtering, sieving and evaporation.<br><br>Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible. | |
| **Seasonal Changes** | **Observe changes across the four seasons**<br><br>**Observe and describe weather associated with the seasons** and how day length varies | | Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Light) | | Use the idea of Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Earth and space) | |

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| | **Pupils should: Observe and talk about changes in the weather and seasons.**<br><br>**Working Scientifically by:** Making tables, charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.<br><br>**Note**<br>Pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses. | | | | | |
| Subject Knowledge | **Key Vocabulary**<br>Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length.<br><br>In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again.<br><br>The weather also changes with the seasons. In the UK, it is usually colder and rainier in Winter and hotter and dryer in the Summer. | | | | | |

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| | The change in weather causes many other changes; some examples are numbers of minibeasts found outside, seed and plant growth, leaves on trees and type of clothes worn by people. | | | | | |
| **Living things and their habitats**<br><br>**Biology**<br><br>**DFE Priorties.**<br>**Eco-Systems** | Observe changes across the four seasons. (Seasonal Changes)<br><br>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Plants)<br><br>Identify and describe the basic structure of a variety of common flowering plants, including trees. (Plants)<br><br>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Animals including humans)<br><br>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Animals including humans) | **Eco-Systems**<br>Explore and compare the differences between things that are living, dead, and things that have never been alive<br><br>**Identify 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**<br><br>**Identify and name a variety of plants and animals in their habitats, including micro-habitats.**<br><br>**Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name** | Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Plants) | **Eco-Systems**<br>**Recognise that living things can be grouped in a variety of ways**<br><br>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment<br><br>**Recognise that environments can change and that this can sometimes pose dangers to living things**<br><br>**Pupils should: Use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitats.**<br><br>**They should identify how habitats change throughout the year.** | **Eco-Systems**<br>**Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.**<br><br>**Describe the life process of reproduction in some plants and animals.**<br><br>**Pupils should: Study and raise questions about their local environment throughout the year.**<br><br>They should observe life cycle changes in a variety of things, for example plants in the vegetable garden or flower border, and animals in the local environment.<br><br>**Find out about the work of naturalists and animal behaviourists e.g. Sir David Attenborough and Jane Goodall.** | **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.**<br><br>Give reasons for classifying plants and animals based on specific characteristics.<br><br>**Pupils should: Build on their learning about grouping living things in Year 4 by looking at classification systems in more detail.**<br><br>**Introduce broad groupings, such as micro-organisms, plants and animals can be subdivided.**<br><br>**Through direct observations where possible, they should** |

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| | Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) (Animals including humans). | **different sources of food.**<br><br>**Pupils should:**<br>**Be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy.**<br><br>**Be introduced to the terms habitat and micro-habitat.**<br><br>**They should raise and answer questions about the local environment that help them to identify a variety of plants and animals.**<br><br>Observe how different living things depend on each other by being a food source or shelter.<br><br>**Compare animals from a familiar habitat to those from a non-familiar habitat (seashore, woodland, in the ocean, in the rainforest).**<br><br>**Working Scientifically by: Sorting and classifying according to whether they are living, dead or were never alive and record these in charts.**<br><br>**Explore questions such as 'Is a flame alive?' 'Is a deciduous tree dead in winter?' and talk** | | **Explore possible use of grouping a wide selection of living things that include animals, flowering and non-flowering plants.**<br><br>**Pupils could start to put vertebrate and invertebrate animals into groups, birds, reptiles, fish, mammals and amphibians.**<br><br>**Note**<br>**Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses.**<br><br>**Explore examples of human impact (both positive and negative) on environments, such as nature reserves, ecologically planned parks, effects of population, development, litter or deforestation.**<br><br>**Working Scientifically by: Using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things.**<br><br>**Raising and answering questions based on their observations of animals and what they have found out about other** | **Find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.**<br><br>**Working Scientifically by: Observing and comparing the lifecycles of plants and animals in their local environments with other plants and animals in their local environments with other plants and animals around the world (include prehistoric times).**<br><br>**Asking pertinent questions and suggesting ideas for similarities and differences. They might try to grow new plants from different parts of the parent plant (seed, stem, root cutting, tubers, bulbs).**<br><br>**They might observe changes in an animal over time (hatching and rearing chicks) and comparing how different animals reproduce and grow.** | **classify animals into commonly found invertebrates (insects, spiders, snails, worms) and vertebrates (reptiles, fish, amphibians, birds and mammals).**<br><br>**They should discuss reasons why living things are placed in one group and not another.**<br><br>**Might find out about the significance of the work scientists such as Carl Linnaeus, a pioneer of classification.**<br><br>**Working Scientifically by: Using classification systems and keys to identify some animals and plants in the immediate environment.**<br><br>They could research unfamiliar animals and plants from a broad range of other habitats and decide if they fit the classification system. |

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| | | **about how to answer these questions.**<br><br>**Simple food chains that include humans (grass, cow, human).**<br><br>**Describe conditions in different habitats and micro habitats.** | | **animals that they have researched.** | | |
| Subject Knowledge | | **Key Vocabulary:**<br>Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc., names of micro-habitats e.g. under logs, in bushes etc.<br><br>All objects are either living, dead or have never been alive.<br><br>Living things are plants (including seeds) and animals.<br><br>Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (this is a simplification but appropriate for year 2 children).<br><br>An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again | | **Key Vocabulary:**<br>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate.<br><br>Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things.<br><br>Living things live in a habitat which provides an environment to which they are suited (year 2 learning).<br><br>These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way i.e. positive human impact, such as setting up nature reserves or in a bad way i.e. negative human impact, such as littering. These environments also | **Key Vocabulary:**<br>Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings.<br><br>As part of their life cycle plants and animals reproduce.<br><br>Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg.<br><br>Animals including humans have offspring which grow into adults.<br><br>In humans and some animals these offspring will be born live, such as babies or kittens, and then grow into adults.<br><br>In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. | **Key Vocabulary:**<br>Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering.<br><br>Living things can be formally grouped according to characteristics.<br><br>Plants and animals are two main groups but there are other livings things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms.<br><br>Plants can make their own food whereas animals cannot.<br><br>Animals can be divided into two main groups – those that have backbones (vertebrates) and those that do not (invertebrates). |

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| | | ignoring that plastics are made of fossil fuels).<br><br>Animals and plants live in a habitat to which they are suited which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well.<br><br>The habitat provides the basic needs of the animals and plants – shelter, food and water.<br><br>Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect what plants and animals live there. The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain. | | change with the seasons; different living things can be found in a habitat at different times of the year | Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis.<br>Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects. | Vertebrates can be divided into five small groups – fish, amphibians, reptiles, birds and mammals.<br>Each group has common characteristics.<br><br>Invertebrates can be divided into a number of groups including insects, spiders, snails and worms.<br><br>Plants can be divided broadly into two main groups – flowering plants and non-flowering plants. |
| **Year 3 Rocks**<br><br>**Chemistry** | Distinguish between an object and the material from which it is made. (Everyday Materials)<br><br>Identify and name a variety of everyday materials, including wood, | Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Everyday Materials) | **Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.** | | | Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. |

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| | plastic, glass, metal, water, and rock. (Everyday materials)<br><br>Describe the simple physical properties of a variety of everyday materials. (Everyday materials)<br><br>Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Everyday materials) | | **Describe in simple terms how fossils are formed when things that have lived are trapped within rock.**<br><br>**Recognise that soils are made from rocks and organic matter.**<br><br>**Link to geography**<br><br>**Pupils should:** Explore different kinds of rock and soils, including those form the local environment.<br><br>**Working Scientifically by: Observing rocks including those in buildings, gravestones and how they change over time.**<br><br>**To classify rocks based on if they have grains or crystals. (Hand lens/microscope).**<br><br>**To explore how fossils are made and which types of animals would be found in sedimentary rock.**<br><br>**Explore different soils and find similarities and differences.**<br><br>Investigate what happens to rocks when they have been rubbed together or change when in water. | | | (Evolution and Inheritance) |

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| | | | To raise and answer questions about the way soils are formed. | | | |
| Subject Knowledge | | | **Key Vocabulary:**<br>Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil.<br><br>Rock is a naturally occurring material.<br><br>There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft.<br><br>They have different sizes of grain or crystal.<br>They may absorb water.<br><br>Rocks can be different shapes and sizes (stones, pebbles, boulders).<br><br>Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter).<br><br>The type of rock, size of rock piece and the amount of organic matter affect the property of the soil. Some rocks contain fossils.<br><br>Fossils were formed millions of years ago. When plants and animals | | | |

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| | | | died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water. | | | |
| **Light**<br><br>**Physics** | Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Animals including humans) | | Recognise that they need light in order to see things and that dark is the absence of light.<br><br>Notice that light is reflected from surfaces.<br><br>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.<br><br>Recognise that shadows are formed when the light from a light source is blocked by an opaque object. | | | **Recognise that light appears to travel in straight lines.**<br><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><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.** |

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| | | | Find patterns in the way that the size of shadows change<br><br>**Pupils should:** Explore what happens when light reflects off a mirror or other reflective surfaces. Playing mirror games to help them answer questions about how light behaves.<br><br>They should think about why they should protect their eyes against bright light.<br><br>They should look for and measure shadows, finding out how they change and how they are formed.<br><br>**Note**<br>Pupils should be warned that it is not safe to stare directly at the sun even when wearing sunglasses.<br><br>**Working Scientifically by:** Looking at patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.<br><br>We do not have any bolded leaps in this topic | | | **Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.**<br><br>**Pupils should:**<br>**Build on light in Year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make a prediction.**<br><br>**Working Scientifically by: Deciding where to place a rear view mirror on cars; designing and making a periscope and explaining how it works.**<br><br>**They might investigate the relationship between light sources, objects and shadows using shadow puppets. They could extend this by looking at phenomena including, rainbows, colours on soap bubbles, objects looking bent in water and coloured filters. (They don't need to explain why these occur)** |
| Subject Knowledge | | | **Key Vocabulary:** | | | **Key Vocabulary:** |

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| | | | Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous.<br><br>We see objects because our eyes can sense light.<br><br>Dark is the absence of light. We cannot see anything in complete darkness.<br><br>Some objects, for example the sun, light bulbs and candles are sources of light.<br>Objects are easier to see if there is more light.<br><br>Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective.<br><br>The light from the sun can damage our eyes and therefore we should not look directly at the Sun and can protect our eyes by wearing sunglasses or sunhats in bright light.<br><br>Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface. | | | As for year 3 plus straight lines, light rays.<br><br>Light appears to travel in straight lines and we see objects when light from them goes into our eyes.<br><br>The light may come directly from light sources but for other objects some light must be reflected from the object into our eyes for the object to be seen.<br><br>Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object. |

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| **Year 3 Forces and Magnets**<br><br>**Year 5 Forces**<br><br>**Physics**<br><br>DFE priority<br>Forces and Magnetism | | Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Uses of everyday materials). | Compare how things move on different surfaces<br><br>**Notice that some forces need contact between two objects, but magnetic forces can act at a distance.**<br><br>**Observe how magnets attract or repel each other and attract some materials and not others.**<br><br>**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.**<br><br>**Describe magnets as having two poles**<br><br>**Predict whether two magnets will attract or repel each other, depending on which poles are facing.**<br><br>**Pupils should: Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example,** | | **Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object**<br><br>**Identify the effects of air resistance, water resistance and friction, that act between moving surfaces**<br><br>**Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.**<br><br>**Pupils should: Explore falling objects and raise questions about the effects of air resistance.**<br><br>**They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall.**<br><br>**They should experience forces that make things begin to move, get faster or slow down.**<br><br>**Explore the effects of friction on movement and find out how it slows or stops moving objects for example a brake on a bicycle wheel.** | |

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| | | | **bar, ring, button and horseshoe).**<br><br>**Working Scientifically by: Comparing how different things move and group them.**<br><br>Raise questions and carry out tests to find out how things move on different surfaces and gathering and recording data to find answers to their questions.<br><br>**Explore the strength of magnets and finding a fair way to test them.**<br><br>**Sorting materials into those that are magnetic and those that are not.**<br><br>Looking for patterns in the way magnets behave in relation to each other and what might effect this, such as strength of the magnet or which pole faces another.<br><br>Identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets. | | **Explore the effects of levers, pulleys, and simple machines on movement.**<br><br>Pupils might find out how scientists such as Galileo Galiei and Isaac Newton helped develop the theory of gravitation.<br><br>**Working Scientifically by: Exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective.**<br><br>**They might explore resistance in water by making and testing boats** | |
| Subject Knowledge | | | **Key Vocabulary:**<br>Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe | | **Key Vocabulary:**<br>Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears. | |

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| | | | magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole<br><br>A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes.<br><br>A magnet attracts magnetic material. Iron and nickel and other materials containing these e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles e.g. a north and south, are brought together they will pull together – attract.<br><br>For some forces to act there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism.<br><br>The magnet does not need to touch the object that it attracts. | | A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance.<br><br>Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.<br><br>Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water or the air and water may be moving over a stationary object.<br><br>A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines. | |

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| **States of Matter**<br><br>**Chemistry**<br><br>**DFE Priority**<br>**Properties and changes of materials** | | | | **Compare and group materials together, according to whether they are solids, liquids or gases**<br><br>**Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)**<br><br>**Identify the part played by evaporation and condensation in the water cycle** and associate the rate of evaporation with temperature.<br><br>**Pupils should: Explore a variety of everyday materials and develop simple descriptions of the state of matter (solids hold their shape, liquids form a pool not a pile, gases escape from an unsealed container).**<br><br>**Investigate water as a solid, liquid and gas and note the changes to water when heated or cooled.**<br><br>**Note: Teachers should avoid using materials where heating is associated with chemical change like burning, baking etc,** | | |

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| | | | | **Working Scientifically by: Grouping and classifying a variety of different materials.**<br><br>**Exploring the effect of heat on butter, chocolate.**<br><br>**They might observe and record evaporation over a period of time, such as a puddle in the playground or washing drying or snowmen melting.** | | |
| Subject Knowledge | | | | **Key Vocabulary:**<br>Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle.<br><br>A solid keeps its shape and has a fixed volume.<br><br>A liquid has a fixed volume but changes in shape to fit the container.<br><br>A liquid can be poured and keeps a level, horizontal surface.<br><br>A gas fills all available space; it has no fixed shape or volume.<br><br>Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured | | |

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| | | | | they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid.<br><br>Melting is a state change from solid to liquid.<br><br>Freezing is a state change from liquid to solid. The freezing point of water is 0°C. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid.<br><br>Water boils when it is heated to 100°C.<br><br>Evaporation is the same state change as boiling (liquid to gas) but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy.<br><br>Condensation is the change back from a gas to a liquid caused by cooling<br>.<br>Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back | | |

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| | | | | into a liquid forming clouds.<br>When too much water has condensed the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle. | | |
| **Sound**<br><br>**Physics** | Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Animals including humans) | | | **Identify how sounds are made, associating some of them with something vibrating.**<br><br>**Recognise that vibrations from sounds travel through a medium to the ear.**<br><br>**Find patterns between the pitch of a sound and features of the object that produced it.**<br><br>**Find patterns between the volume of a sound and the strength of the vibrations that produced it.**<br><br>**Recognise that sounds get fainter as the distance from the sound source increases.**<br><br>**Pupils should: Explore and identify the way sound is made through vibration in a variety of different musical instruments from around the world.** | | |

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| | | | | **How pitch, volume can be altered in a variety of ways.**<br><br>**Working Scientifically by: Finding patterns in the sounds that are made by different objects like saucepan lids, different size elastic bands.**<br><br>**They might make earmuffs to block out sound using different materials.**<br><br>**They could make and play their own instruments.** | | |
| Subject Knowledge | | | | **Key Vocabulary:**<br>Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation<br><br>A sound source produces vibrations which travel through a medium from the source to our ears.<br><br>Different mediums such as solids, liquids and gases can carry sound but sound cannot travel through a vacuum (an area empty of matter).<br><br>The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. | | |

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| | | | | The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source.<br><br>A sound insulator is a material which blocks sound effectively.<br><br>Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds. | | |
| **Electricity**<br><br>**DFE Priority - Electricity** | | | | **Identify common appliances that run on electricity.**<br><br>**Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.**<br><br>**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.**<br><br>**Recognise that a switch opens and closes a circuit and associate** | | **Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.**<br><br>**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.**<br><br>**Use recognised symbols when representing a simple circuit in a diagram.**<br><br>**Pupils should: build on their work from Year 4.** |

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| | | | | **this with whether or not a lamp lights in a simple series circuit.**<br><br>Recognise some common conductors and insulators, and associate metals with being good conductors.<br><br>**Pupils should:**<br>**Construct simple series circuits, trying different components, such as bulbs, buzzers, motors, including switches and use these circuits to create a simple device.**<br><br>**To draw their circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage these will be introduced in Year 6.**<br><br>**Note**<br>**Pupils should be taught about taking precautions for working safely with electricity.**<br><br>**Voltage not to be formally defined at this point.**<br><br>**Working Scientifically by: Observing patterns, for example that bulbs get brighter if more cells are added.**<br><br>**Metals tend to conduct electricity.** | | **Pupils should construct simple series circuits, to help them answer questions about what happens when they try different components, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols.**<br><br>**Note: Pupils are expected to learn about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions to work safely with electricity.**<br><br>**Working Scientifically by: Systematically identifying the effect of changing one component at a time in a circuit.**<br><br>**Designing and making a set of traffic lights.**<br><br>**A burglar alarm or some other useful circuits.** |

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| | | | | **Some materials cannot be used to connect across a gap in a circuit.** | | |
| Subject Knowledge | | | | **Key Vocabulary:**<br>Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol<br><br>**Note**<br>Children in year 4 do not ned to use standard symbols as this is taught in year 6.<br><br>Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries.<br><br>An electrical circuit consists of a cell or battery connected to a component using wires.<br><br>If there is a break in the circuit, a loose connection or a short circuit the component will not work.<br><br>A switch can be added to the circuit to turn the component on and off. | | **Key Vocabulary:**<br>Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage<br>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.<br><br>Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound.<br><br>If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter.<br><br>Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well. |

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| | | | | Metals are good conductors so they can be used as wires in a circuit.<br><br>Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity. | | You can use recognised circuit symbols to draw simple circuit diagrams. |
| **Earth and Space**<br><br>**Physics** | Observe changes across the four seasons. (Seasonal changes)<br><br>Observe and describe weather associated with the seasons and how day length varies. (Seasonal changes) | | | | **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.**<br><br>**Describe the Sun, Earth and Moon and 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 across the sky.<br><br>**Pupils should: Be introduced to a model of the Sun and Earth to help them explain day and night.**<br><br>**Learn that the Sun is a star at the centre of the solar system and has eight planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn,** | |

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| | | | | | Uranus and Neptune) Pluto reclassified as a dwarf planet in 2006.<br><br>Know that the moon is a celestial body that orbits a planet.<br><br>Note:<br>Warn children not to look directly at the sun even with sunglasses as it can damage their eyes.<br><br>Find out about the way ideas about the solar system have developed, understanding how geocentric model gave way to heliocentric model. Scientists Ptolemy, Alhazan and Copernicus.<br><br>Working Scientifically by: comparing time of day in different places by using internet links or direct communication.<br><br>Creating simple models of the solar system.<br><br>Constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day.<br><br>Why they think Stonehenge might have been used as astronomical clocks. | |
| Subject Knowledge | | | | | Key Vocabulary: | |

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| | | | | | Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) spherical, solar system, rotates, star, orbit, planets<br><br>The Sun is a star. It is at the centre of our solar system.<br><br>There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits.<br><br>Earth takes $365\frac{1}{4}$ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (here it is day) and half is facing away from the Sun (night).<br><br>As the Earth rotates the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical. | |

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| **Evolution and Inheritance**<br><br>**Biology**<br><br>**DFE Priority**<br>**Evolution and Inheritance**<br><br>**Ecosystem** | | **Ecosystem**<br>Identify 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, plants, and how they depend on each other. (Y2 Living things and their habitats) | Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Rocks) | **Ecosystem**<br>Recognise that environments can change and that this can sometimes pose a danger to living things. (Living things and their habitats) | | **Ecosystem**<br>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<br><br>**Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.**<br><br>**Pupils should: Build on their knowledge from Year 3 rocks.**<br><br>**Pupils should find out about how living things on Earth have changed.**<br><br>**They should be introduced that characteristics are passed down to the offspring (dog breeds).**<br><br>**Appreciate that variation in offspring over time can make animals more or less able to survive (Giraffes necks getting longer)**<br><br>**They could find out about the work of Mary** |

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| | | | | | | **Anning, Charles Darwin or Alfred Wallace.**<br><br>**Note: You don't need to know about genes or chromosomes.**<br><br>**Working Scientifically by: Observing and raising questions about local animals and how they have adapted to their environment.**<br><br>**How some animals have adapted to survive extreme conditions.**<br><br>**They could investigate and analyse the adaptions of beak, gills, tendrils or brightly coloured and scented flowers.** |
| Subject Knowledge | | | | | | **Key Vocabulary:**<br>Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils.<br><br>All living things have offspring of the same kind, as features in the offspring are inherited from the parents.<br><br>Due to sexual reproduction, the offspring are not identical to their parents and vary from each other.<br><br>Plants and animals have characteristics that make |

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| | | | | | | them suited (adapted) to their environment. If the environment changes rapidly some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time these inherited characteristics become more dominant within the population. Over a very long period of time these characteristics may be so different to how they were originally that a new species is created. This is evolution.<br><br>Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution.<br><br>More recently scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics. |

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| Plants | • Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. |
| Living things and their habitats | • Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta.<br>• Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.<br>• Differences between species |
| Animals including humans | • Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta.<br>• The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases.<br>• The effects of recreational drugs (including substance misuse) on behaviour, health and life processes.<br>• The structure and functions of the gas exchange system in humans, including adaptations to function.<br>• The mechanism of breathing to move air in and out of the lungs.<br>• The impact of exercise, asthma and smoking on the human gas exchange system. |
| Evolution and Inheritance | • Heredity as the process by which genetic information is transmitted from one generation to the next.<br>• A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model.<br>• The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection.<br>• Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction. |
| Seasonal Changes | • The seasons and the Earth's tilt, day length at different times of year, in different hemispheres |
| Materials | • Chemical reactions as the rearrangement of atoms.<br>• Representing chemical reactions using formulae and using equations.<br>• Combustion, thermal decomposition, oxidation and displacement reactions.<br>• Defining acids and alkalis in terms of neutralisation reactions.<br>• The pH scale for measuring acidity/alkalinity; and indicators. |
| Rocks | • The composition of the Earth.<br>• The structure of the Earth.<br>• The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. |
| Light | • The similarities and differences between light waves and waves in matter.<br>• Light waves travelling through a vacuum; speed of light.<br>• The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface.<br>• Use of ray model to explain. imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing<br>• (qualitative); the human eye.<br>• Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in<br>• cameras.<br>• Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption<br>• and diffuse reflection. |
| Forces | • Magnetic fields by plotting with compass, representation by field lines.<br>• Earth's magnetism, compass and navigation.<br>• Forces as pushes or pulls, arising from the interaction between two objects.<br>• Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. |

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| | • Moment as the turning effect of a force.<br>• Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way;<br>• resistance to motion of air and water.<br>• Forces measured in Newtons, measurements of stretch or compression as force is changed. |
| Sound | • Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel –<br>• superposition.<br>• Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound.<br>• Sound needs a medium to travel, the speed of sound in air, in water, in solids.<br>• Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal.<br>• Auditory range of humans and animals.<br>• Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. • Waves transferring information for conversion<br>• to electrical signals by microphone. |
| Electricity | • Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of<br>• charge.<br>• Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential<br>• difference (p.d.) to current.<br>• Differences in resistance between conducting and insulating components (quantitative).<br>• Static electricity. |
| Earth and Space | • Gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces<br>• between Earth and Moon, and between Earth and Sun (qualitative only).<br>• Our Sun as a star, other stars in our galaxy, other galaxies.<br>• The seasons and the Earth's tilt, day length at different times of year, in different hemispheres.<br>• The light year as a unit of astronomical distance. |