

Chiltern Primary School Science Progression Map

Together, over time, we are proud to learn to make a difference, to ourselves and others.

Our Curriculum Vision:

- Our Chiltern community celebrates differences and diversity within a safe and nurturing environment.
- A curriculum, which engages and enriches.
- Has ambition for all moving from novice to expert.

What does this look like within Science?

Diversity – We ensure that all children irrespective of background will experience a range of science skills, knowledge and role models that celebrate our diverse science culture.

Engagement and enrichment – Children experience a wide variety of theoretical and practical lessons that are engaging, thought provoking and inspiring and are linked to issues and occurrences in their community and everyday life.

Ambition – We want children to develop and become knowledgeable, investigative and analytical thinkers with inquisitive minds who are increasingly knowledgeable about the world around them and our impact upon it.

At Chiltern, we want children to be able to make informed decisions about their health, their immediate environment and the wider world.

Science Skills for ALL children at Chiltern

We will ensure that children have

a secure understanding of knowledge and concepts, using technical terminology accurately and precisely.
the ability to seek answers to questions through collecting, analysing and presenting data.
an understanding of the uses and implications of science, for today and for the future.

What we want a Scientist at Chiltern to achieve

At Chiltern, we want to ensure that all children have access to a high-quality Science education that provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. We believe that the best Science teaching fosters and develops pupils' curiosity in the subject whilst also helping them to fulfil their interest, inquisitive minds and potential. We endeavour to make lessons thought provoking and inspiring, leading children to wonder, ask questions, research and then discuss their learning at home. Science in our school is about acquiring the necessary scientific knowledge and developing children's ideas and ways of working, that enable them to answer scientific questions and make sense of the world in which they live, through investigation and using and applying process skills. We seek to ensure that the skills we have mapped out and the knowledge and vocabulary acquired prepare them for the next stages in their education. Ultimately, we aspire to ensure the children become resilient, independent and curious scientists who ask questions and find things out for themselves. Children will be enthusiastic, confident and motivated scientific learners, enjoying the process of exploring values and ideas through Science.

The National Expectations:

The National Curriculum for Science in England was introduced by the Department of Education in 2014. It states that: A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop a secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant

difficulties in understanding higher-order content.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

The nature, processes and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. 'Working scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Key Stage 1 National Curriculum Expectations	Key Stage 2 National Curriculum Expectations	Key Stage 2 National Curriculum Expectations
<p>The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas and findings to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out.</p> <p><i>'Working scientifically'</i> is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and</p>	<p>LKS2</p> <p>The principal focus of science teaching in Lower Key Stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.</p> <p><i>'Working scientifically'</i> is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout</p>	<p>UKS2</p> <p>The principal focus of science teaching in Upper Key Stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At Upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.</p> <p><i>'Working and thinking scientifically'</i> is described separately at the beginning of the programme of study, but must</p>

<p>guidance, examples show how scientific methods and skills might be linked to specific elements of the content.</p> <p>Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.</p> <p>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> *asking simple questions and recognising that they can be answered in different ways *observing closely, using simple equipment *performing simple tests *identifying and classifying *using their observations and ideas to suggest answers to questions *gathering and recording data to help in answering questions 	<p>the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.</p> <p>Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.</p> <p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> *asking relevant questions and using different types of scientific enquiries to answer them *setting up simple practical enquiries, comparative and fair tests *making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers *gathering, recording, classifying and presenting data in a variety of ways to help in answering questions *recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables *reporting on findings from enquiries, including oral and written explanations, displays or presentations of results 	<p>always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.</p> <p>Pupils should read, spell and pronounce scientific vocabulary correctly.</p> <p>During Years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> * planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary * taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate * recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs * using test results to make predictions to set up further comparative and fair tests * reporting and presenting findings from enquiries,
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	<p>and conclusions</p> <p>*using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>*identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>*using straightforward scientific evidence to answer questions or to support their findings.</p>	<p>including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>* identifying scientific evidence that has been used to support or refute ideas or arguments</p>
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Intent

We offer a structured sequence of quality lessons, helping children to fully cover the skills required to meet the aims of the National Curriculum and to encourage ambition and excellence. The content allows for a broad, deep understanding of Science and how it links to children's lives. Through weaving in prior learning, the Science curriculum offers a range of opportunities for consolidation, challenge, variety and awe and wonder. This allows children to apply the fundamental principles and concepts of science, not only in this field but across the Curriculum and beyond. They develop analytical problem-solving skills and learn to evaluate and apply their knowledge in science lessons and across the curriculum. It also enables them to become responsible, competent, confident investigators with a thirst for knowledge. They develop an understanding of the need for science in the world in which they live and develop skills that allow them to research into and investigate what they would like to know. The use of first-hand experiences will deepen their understanding where possible. The Science curriculum complements and enhances all other subjects, particularly in the areas of problem solving, investigating, data handling and analytical thinking. Studying Science will make a difference to the children's learning across the whole of the Curriculum and will prepare them for life beyond Chiltern.

Implementation

Each lesson consists of the revisiting of prior knowledge and vocabulary, direct teaching of new skills and vocabulary, analysis of new learning and application, research and investigation to help embed what has been taught. Through the careful sequencing of lessons, we intend to inspire and excite pupils, to develop a love of science

and the world they live in, see the place of science in the present, past and in their future and give teachers confidence. Cross-curricular links are also important in supporting other areas of learning. Our lesson plans and resources help children to build on prior knowledge at the same time as introducing new skills and challenges. The programmes of study for science are set out year-by-year for Key Stages 1 and 2. Science units are introduced mainly in KS1 and revisited and built upon through different year groups in KS2. In Key Stage 1, the learning focus is on plants, animals including humans, everyday materials, seasonal changes. In Lower KS2, rocks and soils, forces and magnets, states of matter, sound, electricity and light are introduced for the first time with a link to previous learning on materials when rocks and soils are studied. Animals including humans, plants and living things and their habitats are revisited but with more complex learning objectives that build on previous learning and for different purposes. In Upper KS2 children develop their knowledge in the areas of living things and their habitats, animals including humans, properties and changes of materials, forces, electricity and light even further with more complex learning objectives, more focus on independent learning, questioning and discussion of previous learning linking to current learning. Earth and Space is a new unit taught but links heavily to previous learning on seasonal changes in Year 1 and forces in Year 3. Evolution and Inheritance in Year 6 is also a new concept but the learning links to previous learning in animals including humans' units.

'Working and thinking scientifically' will always be taught through and clearly related to the substantive science content in the programmes of study. There are seven strands that will be taught throughout primary school years:

- *Asking and answering questions and recognizing that they can be answered in different ways
- *Making observations and taking measurements
- *Engaging in practical enquiry to answer questions – setting up fair tests and making predictions
- *Recording and presenting evidence
- *Interpreting, answering questions and concluding
- *Evaluating and raising further questions and predictions
- *Communicating their findings

In Key Stage 1 the working scientifically focus is to enable pupils to be encouraged to ask simple questions and recognise that they can be answered in different ways, to observe closely, to use simple equipment, to perform simple tests, to identify and classify using their observations and ideas to suggest answers to questions and to gather and record data to help in answering questions.

In Lower Key Stage 2, the focus for working scientifically is to enable pupils to broaden their scientific view of the world around them. They will achieve this by asking relevant questions and using different types of scientific enquiries to answer them, setting up simple practical enquiries, comparative and fair tests, making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers, gathering, recording, classifying and presenting data in a variety of ways to help in answering questions, recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables, reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions, using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions, identifying differences, similarities or changes related to simple scientific ideas and processes and using straightforward scientific evidence to answer questions or to support their findings.

In Upper Key Stage 2, the principal focus for working scientifically is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. We expect children in Years 5 and 6 to do this by planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary, taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate, recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs, using test results to make predictions to set up further comparative and fair tests, reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations and identifying scientific evidence that has been used to support or refute ideas or arguments

Impact

At Chiltern, we want to ensure that all children have access to a high-quality, ambitious Science education that provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. We seek to ensure that Science is seen as part of their lives now and in the future and that the skills and knowledge we have mapped out prepare them for the next stages in their education. Science in our school is about acquiring the necessary scientific **knowledge and developing children's** ideas and ways of working, that enable them to answer scientific questions and make sense of the world in which they live, through investigation and using and applying process skills. As a result, we want all of our children be scientific, analytical thinkers who become resilient, independent and curious scientists who ask questions and find

things out for themselves. Science teaches you how to observe, question, problem solve and become a critical thinker. It allows you to generate solutions for everyday life and helps us to answer the great mysteries of the universe. Science involves the learning of the life skills of safety, planning, questioning, creativity, curiosity, confidence, critical thinking, motivation, communication, analysing, decision making, flexibility and evaluation.

In short, we want children to be enthusiastic, confident and motivated scientific learners, enjoying the process of exploring values and ideas through Science.

Learning in Science will be enjoyed across the school. Teachers will have high expectations and quality evidence will be presented in a variety of forms. Children will use scientific vocabulary accurately, alongside a progression in their scientific skills and knowledge. They will be confident using a range of equipment to investigate answers to questions they have formulated. Children will see the scientific world as part of their world, extending beyond school, and understand the meaning and importance of scientific developments. They will be confident scientists with the skills and knowledge to question findings. The reinforcement of vocabulary year-on-year will allow children to take this knowledge with them to secondary school and beyond.

We want all of our children be scientific thinkers. Science teaches you how to tackle large problems by breaking them down into a sequence of smaller, more manageable problems using your knowledge. It can allow you to tackle complex problems in efficient ways that operate at a huge scale.

In short, we want children to understand and master all aspects of science, understand scientific inventions from the past and present and how they impact on our lives today, know about specific scientists and how they link to their learning and solve problems in almost any discipline.

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
This is what scientists at Chiltern can do.....	Children will ask questions about the environment including the weather outside. They will be able to suggest what they might wear. They will develop an	Children will be asking questions about the local environment including plants and animals found there including how they can look after them. They will observe and talk	Children will be asking questions about the local environment including discussing how plants grow, survive, germinate and reproduce. They investigate different	Children will be asking questions about the local environment and using their observation skills to identify parts of a flower and know how water transports around the plant.	Children will be asking questions about the local environment and observe how the environment can change along with the dangers this can cause. They will understand	Children will understand the changes that occur in humans from birth to old age and understand reproduction in plants and animals. They	Children will understand how the circulatory system works and will be able to use this to explain the positive and negative effects of diet, exercise, drugs and

<p>understanding of growth, decay and changes over time and show care and concern for living things and the environment. They will use their senses when walking around and investigating. They will develop questioning and curiosity through play and understand the concept of forces and electricity through twisting, pushing, slotting and magnetic toys and seeing the effects of pushing different buttons to make sounds and movements. They can talk about similarities and differences between living things and materials and make simple observations about animals.</p>	<p>about the weather and changes. They will explore different materials using scientific language to describe them.</p>	<p>habitats (including micro) and observe how different animals depend on each other and its life processes. They understand the basic needs of animal survival including exercise and nutrition. They can identify properties of materials and state why they are suited to purpose.</p>	<p>Children will understand the life cycle of a plant by drawing diagrams and using research to find the function of each part. Children will know that humans and animals have skeletons and be able to explain why. They know how humans get nutrients. They will carry out comparative and fair tests to compare and classify rocks and soils based on their properties.</p>	<p>the functions of the teeth and the importance of oral hygiene. Children will know about how the digestive system works. Children will be grouping, identifying and classifying living things and materials and using classification keys. Children will understand the water cycle and the effect of heat with evaporation and condensation as well as materials changing state. Children will use representations to understand how we hear through vibrations and know how to create simple circuits including a switch. Comparative and fair tests will be used to test conductivity of materials.</p>	<p>explore different lifecycles and can understand the similarities and differences between mammals, amphibians, insects and birds. Children will be able to explain the uses of everyday materials and describe some reversible and irreversible changes. They will be able to present their results from fair tests using tables and charts. Children will use diagrams to show the movement of the Earth and the moon and can explain how different time zones occur. They explain day and night. They will understand forces including gravity, air resistance, water resistance and friction. They will be able to use mechanisms such as levers, pulleys</p>	<p>lifestyle on the body. They will be able to recall animals from the five vertebrate groups and some from non-vertebrate groups including their key characteristics. They will understand how plants and animals are suited to their environment and the process of evolution. Children will be able to use classification keys to identify unknown plants. They will know what fossils are and can use research and observations to show that things lived a billion years ago. Children will use diagrams to explain how light travels and understand shadows. They will be able to make circuits using recognized symbols in their drawings. They can conduct a range of</p>
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						and gears to explain forces.	<p>fair tests identifying cause and effect when testing the brightness of a bulb or volume of a buzzer. Children will be able to conduct a range of investigations that are self – led with accuracy using repeat measurements and a range of equipment. They will use scientific theory to refute or support their arguments.</p>
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	KS1	LKS2	UKS2
Working Scientifically	<p><u>Asking questions and recognising that they can be answered in different ways</u></p> <p>Asking simple questions and recognizing that they can be answered in different ways.</p> <p>*While exploring the world, the children develop their ability to ask questions, such as what something is, how things are similar and different, the way things work, which alternative is better, how things change and how they happen. Where appropriate, they answer these</p>	<ul style="list-style-type: none"> ▪ <u>Asking questions and recognizing that they can be answered in different ways</u> ▪ <u>Asking relevant questions and using different types of scientific enquiries to answer them</u> ▪ *The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. ▪ *The children answer questions posed by the teacher. ▪ *Given a range of resources, the children decide for 	<ul style="list-style-type: none"> ▪ <u>Asking questions and recognizing that they can be answered in different ways</u> ▪ <u>Planning different types of scientific enquiries to answer questions, including recognizing and controlling variables where necessary.</u> ▪ *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. ▪ *Given a wide range of resources the children decide

<p>questions.</p> <p>*The children answer questions developed with the teacher often through a scenario.</p> <p>*The children are involved in planning how to use the 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.</p> <p>Children can:</p> <p>*explore the world around them, leading them to ask some simple scientific questions about how and why things happen;</p> <p>*begin to recognise ways in which they might answer scientific questions;</p> <p>*ask people questions and use simple secondary sources to find answers;</p> <p><u>Making observations and taking measurements</u></p> <p><u>Observing closely, using simple equipment</u></p> <p>*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</p>	<p>themselves how to gather evidence to answer a 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.</p> <p>Children can:</p> <p>*start to raise their own relevant questions about the world around them in response to a range of scientific experiences;</p> <p>*start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;</p> <p><u>Making observations and taking measurements</u></p> <p><u>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</u></p> <p>*The children make systematic and careful observations.</p> <p>* They use a range of equipment for measuring length,</p>	<p>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.</p> <p>Children can:</p> <p>*with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences;</p> <p>*with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;</p> <p>*explore and talk about their ideas, raising different kinds of scientific questions;</p> <p>*ask their own questions about scientific phenomena;</p> <p>*select and plan the most appropriate type of scientific enquiry to use to answer scientific questions;</p> <p><u>Making observations and taking measurements</u></p> <p><u>Taking measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate</u></p> <p>*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.</p>
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	<p>magnifying glasses or digital microscopes, to make their observations.</p> <p>*They begin to take measurements, initially by comparisons, then using non-standard units.</p> <p>Children can:</p> <ul style="list-style-type: none"> *observe the natural and humanly constructed world around them; *observe changes over time; *use simple measurements and equipment; *make careful observations, sometimes using equipment to help them observe carefully. <p><u>Engaging in practical enquiry to answer questions</u></p> <p><u>Performing simple tests</u></p> <p>*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.</p> <p>Children can:</p> <ul style="list-style-type: none"> *carry out simple practical tests, using simple equipment; 	<p>time, temperature and capacity. They use standard units for their measurements.</p> <p>Children can:</p> <ul style="list-style-type: none"> *make systematic and careful observations; *observe changes over time; *use a range of equipment, including thermometers and data loggers; *ask their own questions about what they observe; *where appropriate, take accurate measurements using standard units using a range of equipment <p><u>Engaging in practical enquiry to answer questions</u></p> <p><u>Setting up simple practical enquiries, comparative and fair tests</u></p> <p>*The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher.</p> <p>* They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.</p> <p>Children can:</p>	<ul style="list-style-type: none"> • 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). <p>Children can:</p> <ul style="list-style-type: none"> *choose the most appropriate equipment to make measurements and explain how to use it accurately; *take measurements using a range of scientific equipment with increasing accuracy and precision; *take repeat readings when appropriate; *understand why we take an average in repeat readings. <p><u>Engaging in practical enquiry to answer questions</u></p> <p><u>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</u></p> <p>*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</p>
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<p>*experience different types of scientific enquiries, including practical activities;</p> <p>*talk about the aim of scientific tests they are working on;</p> <p>*with support, start to recognise a fair test.</p> <p><u>Identifying, Classifying, Recording and presenting evidence</u></p> <p><u>Identifying and classifying</u></p> <p>* 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.</p> <p>*They use simple secondary sources (such as identification sheets) to name living things. They</p>	<p>*recognise when a fair test is necessary;</p> <p>*make simple predictions based on prior knowledge and understanding;</p> <p>*help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used;</p> <p>*set up and carry out simple comparative and fair tests.</p> <p><u>Identifying, Classifying, Recording and presenting evidence</u></p> <p><u>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</u></p> <p><u>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</u></p> <p>*The children sometimes decide how to record and present evidence. They record their observation e.g. using</p>	<p>and relationships using a suitable sample</p> <p>Children can:</p> <p>*make predictions;</p> <p>*make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them;</p> <p>*plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary;</p> <p>*use their test results to identify when further tests and observations may be needed;</p> <p>* use test results to make predictions for further tests.</p> <p><u>Identifying, Classifying, Recording and presenting evidence</u></p> <p><u>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</u></p> <p>* The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They</p>
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<p>describe the characteristics they used to identify a living thing.</p> <p><u>Gathering and recording data to help in answering questions</u></p> <ul style="list-style-type: none"> * The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. *They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. *They classify using simple prepared tables and sorting rings. <p>Children can:</p> <ul style="list-style-type: none"> *use simple features to compare objects, materials and living things; *decide how to sort and classify objects into simple groups with some help; *record and communicate findings in a range of ways with support; *sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables. 	<p>photographs, videos, pictures, labelled diagrams or writing</p> <p>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.</p> <ul style="list-style-type: none"> * Children are supported to present the same data in different ways in order to help with answering the question. <p>Children can:</p> <ul style="list-style-type: none"> *talk about criteria for grouping, sorting and classifying; *group and classify things; *collect data from their own observations and measurements; *present data in a variety of ways to help in answering questions; *use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; *record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. 	<p>record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys</p> <p>*Children present the same data in different ways in order to help with answering the question.</p> <p>Children can:</p> <ul style="list-style-type: none"> *independently group, classify and describe living things and materials; *use and develop keys and other information records to identify, classify and describe living things and materials; *decide how to record data from a choice of familiar approaches; *record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.
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Drawing conclusions, Noticing Patterns and Presenting Findings

Using their observations and ideas to suggest answers to questions

*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.

Children can:

- * recognise 'biggest and smallest', 'best and worst' etc. from their data.
- *notice links between cause and effect with support;
- *begin to notice patterns and relationships with support;
- *begin to draw simple conclusions;
- *identify and discuss differences between their results;
- *use simple and scientific language;
- *read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1;
- *talk about their findings to a variety of audiences in a variety of ways.

Drawing conclusions, Noticing Patterns and Presenting Findings

Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

* They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.

*Children 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.

* Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.

Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

* They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.

Children can:

- *draw simple conclusions from their results;
- *make predictions;
- *suggest improvements to investigations;
- *raise further questions which could be investigated;
- *first talk about, and then go on to write about, what they

Drawing conclusions, Noticing Patterns and Presenting Findings

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

*They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used.

*They identify any limitations that reduce the trust they have in their data.

* In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.

* They communicate their findings to an audience using relevant scientific language and illustrations.

Using test results to make predictions to set up further comparative and fair tests

* Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.

Children can:

- *notice patterns;

have found out;
*report and present their results and conclusions to others in written and oral forms with increasing confidence.

*draw conclusions based in their data and observations;
*use their scientific knowledge and understanding to explain their findings;
*read, spell and pronounce scientific vocabulary correctly;
*identify patterns that might be found in the natural environment;
*look for different causal relationships in their data;
*discuss the degree of trust they can have in a set of results;
*independently report and present their conclusions to others in oral and written forms.

Evaluating and raising further questions and predictions

Evaluating and raising further questions and predictions

Using straightforward scientific evidence to answer questions or to support their findings.

* 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.

Identifying scientific evidence that has been used to support or refute ideas or arguments

* 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 understanding, supports or refutes their answer.

Identifying differences, similarities or changes related to simple scientific ideas and processes

*Children interpret their data to generate simple comparative statements based on their evidence. They

*They talk about how their scientific ideas change due to new evidence that they have gathered.
*They talk about how new discoveries change scientific

begin to identify naturally occurring patterns and causal relationships.

Children can:

- *make links between their own science results and other scientific evidence;
- *use straightforward scientific evidence to answer questions or support their findings;
- *identify similarities, differences, patterns and changes relating to simple scientific ideas and processes;
- *recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.

understanding.

Children can:

- *use primary and secondary sources evidence to justify ideas;
- *identify evidence that refutes or supports their ideas;
- *recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact;
- *use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas;
- *talk about how scientific ideas have developed over time.

Plants	
	National Curriculum Statements in red are from other linked topics
Early Learning Goal	*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.
Key indicators	<ul style="list-style-type: none"> *Know and understand growth, decay and changes over time. *Know how to show concern and care for living things and the environment.
Year 1	<ul style="list-style-type: none"> *Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. *Identify and describe the basic structure of a variety of common flowering plants, including trees
Key indicators	<ul style="list-style-type: none"> *Know how to name and describe the parts of a tree, including roots, trunk, branches, twig and leaves. *Know how to describe the key features of the trees and plants e.g. shapes of leaves/colour of the flower/blossom. *Know which trees lose their leaves and those that keep them all year. *Know how to identify and name some deciduous and evergreen trees such as oak tree, a flowering cherry tree and a fir tree. *Know how to name and describe the parts of a flowering plant, including roots, stem, leaves, flower and seed. *Know that plants can grow and change. *Know how to use simple charts to sort. *Know how to use pictures to talk about how plants change.
Year 2	<ul style="list-style-type: none"> *Observe and describe how seeds and bulbs grow into mature plants. *Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. *Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)
Key indicators	<ul style="list-style-type: none"> *Know how to describe how plants that have grown from seeds and bulbs have developed over time. *Know the similarities and differences between bulbs and seeds. *Know how to observe, nurture and describe how seeds and bulbs grow into mature plants (by growing daffodil and hyacinth bulbs, cress seeds and runner beans) *Know that plants are living things because they can move, grow, react to their surroundings, absorb nutrients and reproduce. *Know that plants need water, light, nutrients and a suitable temperature to grow and stay healthy. *Know how to describe the impact of changing growing conditions for plants.

Year 3	<ul style="list-style-type: none"> * Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. * 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. * Investigate the way in which water is transported within plants. * Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Key indicators	<ul style="list-style-type: none"> * Know how to explain the function of the different parts of a flowering plant. * Know how to describe the life cycle of flowering plants, including the process of pollination, seed formation, seed dispersal, fertilisation and germination. * Know different methods of pollination and seed dispersal and can give examples. * Can explain observations made during investigations. * Know how to look at features of seeds to decide on methods of dispersal. * Know how to draw and label a diagram of my created flowering plant to show its parts and their role and method of pollination and seed dispersal.
Year 4	<ul style="list-style-type: none"> * Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) * Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats) * Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	<ul style="list-style-type: none"> * Describe the life process of reproduction in some plants and animals. (Y5 – Living things and their habitats)
Year 6	<ul style="list-style-type: none"> * 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. (Y6 - Living things and their habitats) * Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
Key Stage 3	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	
National Curriculum Statements in red are from other linked topics	

Early Learning Goal	*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.
Year 1	<ul style="list-style-type: none"> * Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) * Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) * Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) * Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) * Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 –Animals, including humans) * Observe changes across the four seasons. (Y1 - Seasonal change)
Year 2	<ul style="list-style-type: none"> *Explore and compare the differences between things that are living, dead, and things that have never been alive. * 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. * Identify and name a variety of plants and animals in their habitats, including microhabitats. *Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. * Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans)
Key indicators	<ul style="list-style-type: none"> *Know that all objects are either living, dead or have never been alive. *Know living things are plants (including seeds) and animals. *Know dead things include dead animals and plants and parts of plants and animals that are no longer attached. *Know how to identify and name a variety of plants and animals in their habitats, including micro-habitats. *Know that animals and plants live in habitats to which they are suited and that give them the things they need to survive. I can talk about the features of these habitats. *Know that animals and plants depend on each other to survive. I can show this by constructing a food chain. *Know that all living things have a part to play in food chains and without them, other animals and plants may not be able to survive.
Year 3	*Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)

Year 4	<ul style="list-style-type: none"> *Recognise that living things can be grouped in a variety of ways. *Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. *Recognise that environments can change and that this can sometimes pose dangers to living things. *Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)
Key indicators	<ul style="list-style-type: none"> *Know that all living things, which can also be called organisms, have to do certain things to stay alive. These are called life processes. *Know that living things live in a range of habitats and can be grouped/classified in different ways according to their features. *Know how to create a classification key to identify unknown plants and animals. *Know that an environment may change both naturally and due to human impact.
Year 5	<ul style="list-style-type: none"> * Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. * Describe the life process of reproduction in some plants and animals
Key indicators	<ul style="list-style-type: none"> *Know how to describe the lifecycles of mammals, amphibians and insects using diagrams. *Know how to explain and describe the difference between sexual and asexual reproduction. *Know how to explain metamorphosis and give examples through amphibians and insects. *Know how to describe the similarities and differences between different plants' and animals' life cycles.
Year 6	<ul style="list-style-type: none"> *Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. * Give reasons for classifying plants and animals based on specific characteristics. * Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. (Y6 -Evolution and inheritance) * Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. (Y6 -Evolution and inheritance)
Key indicators	<ul style="list-style-type: none"> *Know how to give examples of animals in the five vertebrate groups and some of the invertebrate groups. *Know that vertebrates can be divided into five small groups: fish, amphibians, reptiles, birds and mammals. Each group has common characteristics which I can name. *Know that invertebrates can be divided into a number of groups including insects, spiders, snails and worms.

	<p>*Know that plants can be broadly divided into two main groups: flowering plants and non-flowering plants. I can give examples of flowering and non-flowering plants.</p> <p>*Know how to use classification keys to sort living things into broad groups then sub groups according to observable characteristics.</p> <p>*Know how to create classification keys.</p> <p>*Know how to identify similarities and differences between living things in order to determine their classification.</p>
Key Stage 3	<p>*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.</p> <p>* Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.</p> <p>*Differences between species.</p>

Animals including Humans	
	National Curriculum Statements in red are from other linked topics
Early Learning Goal	*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.
Key indicators	<p>*Know how to talk about simple similarities and differences between living things.</p> <p>*Know how to make simple observations about animals and explain why some things occur.</p>
Year 1	<p>*Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>*Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>*Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</p> <p>*Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p>

Key indicators	<ul style="list-style-type: none"> *Know how to identify and name some common animals. *Know how to identify and name a range of animals from each of the vertebrate groups. *Know how to describe and compare the features and structure of a variety of common animals. *Know how to label key features on a picture/diagram. *Know how to describe what a range of animals eat. *Know how to begin to compare, sort and group and classify animals using a criteria. *Know how my body changes when we exercise. *Know that humans have five senses and they find out about the world using their senses. *Know which part of the body is associated with each sense.
Year 2	<ul style="list-style-type: none"> * Notice that animals, including humans, have offspring which grow into adults. * Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). * Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. *Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. (Y2 - Living things and their habitats)
Key indicators	<ul style="list-style-type: none"> *Know that a life cycle is the series of changes that an animal or plant passes through from the beginning of its life until its death. *Know and can describe how animals change as they grow older. *Know how humans change as they grow. *Know how to sequence the stages of a baby and observe these changes. *Know how insects change through lifecycle diagrams. *Know all animals need water, air, food, shelter and sleep to survive. *Know that in order to be healthy, humans need to eat a balanced diet and healthy food, take exercise to keep their muscles and bones healthy and maintain high standards of hygiene to prevent illness and disease. *Know the effect of exercise on my body.
Year 3	<ul style="list-style-type: none"> * Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. * Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Key indicators	<ul style="list-style-type: none"> *Know that food contains a range of different nutrients needed by the body to stay healthy – protein, carbohydrates, fats, vitamins, minerals, fibre, water. *Know that in order to be healthy we need to eat the right types of food to give us the correct amount of nutrients. *Know the different food types - Fruit and vegetables, Bread, rice, potatoes, pasta and other starchy foods, Milk and dairy, Oils and spreads and Meat, fish, eggs, beans and other non-dairy sources of protein. *Know how to classify food groups and answer questions about nutrients in food. *Know how to use data to look for patterns. *Know how to identify the main bones in the body and label a human skeleton with some scientific names of bones. *Know that skeletons with a backbone are called endoskeletons. *Know that when a skeleton exists outside the body it is called an exoskeleton. *Know that an endoskeleton protects organs, provides support and shape to an animal's body and helps the body to move through the joints and can explain how. * I can compare the skeleton of a human and a different type of animal and note similarities and differences. *Know that joints are where bones meet and that they allow our bodies to move. *Know and can describe how muscles help us to move.
Year 4	<ul style="list-style-type: none"> *Describe the simple functions of the basic parts of the digestive system in humans. *Identify the different types of teeth in humans and their simple functions. *Construct and interpret a variety of food chains, identifying producers, predators and prey.
Key indicators	<ul style="list-style-type: none"> *Know how to identify and name parts of the human digestive system. *Know how to sequence the main parts of the digestive system. *Know how to draw the main parts of the digestive system onto a human outline. * Know how to explain the functions of the digestive system. *Know the types and functions of human teeth. *Know how we look after our teeth and what happens if we don't look after our teeth. *Know how to explain teeth in animals and if they are carnivores, herbivores or omnivores. *Know that living things can be classified as producers, predators and prey according to their place in the food chain. *Know how to identify the producer, predator and prey.

Year 5	<ul style="list-style-type: none"> * Describe the changes as humans develop to old age. * Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) * Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
Key indicators	<ul style="list-style-type: none"> * Know how to name and order the main stages of human development * Know how to explain the changes that occur during the stages of human development. * Know that puberty is the change that happens in late childhood and adolescence where the body starts to change because of hormones. * Know how to explain the main changes that take place in boys and girls during puberty. * Know how to explain how a baby changes physically as it grows and also what it is able to do.
Year 6	<ul style="list-style-type: none"> * Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. * Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. * Describe the ways in which nutrients and water are transported within animals, including humans. * 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. (Y6 - Living things and their habitats) * Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
Key indicators	<ul style="list-style-type: none"> * Know how to identify and describe components of blood and their respective functions, noting the different blood groups. * Know that the heart pumps blood in the blood vessels around to the lungs. * Know the names of the four chambers of the heart. * Know that oxygen goes into the blood and carbon dioxide is removed. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again. This is the human circulatory system. * Know that nutrients, oxygen and water are transported around the body in the blood to the muscles and other parts of the body where they are needed. * Know how to draw a diagram of the circulatory system, label the parts and annotate it to show what the parts do. * Know that diet, exercise, drugs and lifestyle have an impact on the way our bodies function. * Know how to explain the positive and negative effects of diet, exercise, drugs and lifestyle on the body. * Know how to explain how my pulse changes with exercise and the most effective way of presenting this data. * Know the effect exercise has on my heart.
Key Stage 3	<ul style="list-style-type: none"> * 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

	<p>foetus through the placenta.</p> <ul style="list-style-type: none"> * The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. * The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. * The structure and functions of the gas exchange system in humans, including adaptations to function. * The mechanism of breathing to move air in and out of the lungs. *The impact of exercise, asthma and smoking on the human gas exchange system
<h2 style="margin: 0;">Evolution and Inheritance</h2>	
	<p>National Curriculum Statements in red are from other linked topics</p>
Early Learning Goal	<p>*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.</p>
Year 1	
Year 2	<ul style="list-style-type: none"> *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. (Y2 - Living things and their habitats) *Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)
Year 3	<ul style="list-style-type: none"> *Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) *Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Year 4	<ul style="list-style-type: none"> * Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	<ul style="list-style-type: none"> * Describe the life process of reproduction in some plants and animals. (Living things and their habitats - Y5)
Year 6	<ul style="list-style-type: none"> *Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. * Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.

	<ul style="list-style-type: none"> * Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
	<ul style="list-style-type: none"> *Know how to explain the process of evolution. *Know what inheritance is and how it works. *Know that plants and animals have characteristics that make them suited (adapted) to their environment. *Know how an animal or plant has evolved over time and can give examples e.g penguin and peppered moth. *Know things that lived millions of years ago and can recognise the role fossils have in the development of evolutionary theory.
Key Stage 3	<ul style="list-style-type: none"> * Heredity as the process by which genetic information is transmitted from one generation to the next. * 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. *The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. * 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	
National Curriculum Statements in red are from other linked topics	
Early Learning Goal	<ul style="list-style-type: none"> *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.
Year 1	<ul style="list-style-type: none"> *Observe changes across the four seasons. * Observe and describe weather associated with the seasons and how day length varies.
Key indicators	<ul style="list-style-type: none"> *Know the names of all four seasons and can identify when in the year they occur. *Know, can observe and describe the weather in different seasons. *Know the weather changes with the seasons. *Know how the amount of daylight affects the length of day. *Know how to describe how day length varies from Winter to Spring and Spring to Summer. Days are longer in summer and shorter in winter. *Know how to collect, present and record simple data about the weather in Spring and Summer and compare it to Autumn and Winter.

Year 2	
Year 3	*Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)
Year 4	
Year 5	* Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space)
Year 6	
Key Stage 3	*The seasons and the Earth's tilt, day length at different times of year, in different hemispheres.

Materials	
	National Curriculum Statements in red are from other linked topics
Early Learning Goal	*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.
Key indicators	*Know how to talk about simple similarities and differences between two materials.
Year 1	<ul style="list-style-type: none"> *Distinguish between an object and the material from which it is made. *Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. *Describe the simple physical properties of a variety of everyday materials. *Compare and group together a variety of everyday materials on the basis of their simple physical properties

Key indicators	<ul style="list-style-type: none"> *Know that all objects are made from one or more materials. *Know how to identify and say the names of a variety of everyday materials *Know how to describe the simple properties of everyday materials. *Know how to compare, sort and group everyday materials on the basis of their physical properties. *Know how to test evidence to answer a question.
Year 2	<ul style="list-style-type: none"> * Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. * Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
Key indicators	<ul style="list-style-type: none"> *Know how to name an object and say what material it is made from. *Know how to identify properties of materials. *Know that materials are used for different purposes based on their properties *Know what properties of materials make them suitable for a particular use *Know that the shape of some materials can be changed when they are stretched, twisted, bent and squashed. *Know how to use suitable vocabulary. *Know how to perform simple tests relevant to properties. *Know how to describe similarities and differences between materials.
Year 3	<ul style="list-style-type: none"> *Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) *Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) *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. (Y3 - Forces and magnets)
Year 4	<ul style="list-style-type: none"> *Compare and group materials together, according to whether they are solids, liquids or gases. * 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). * Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. *Recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity)
Key indicators	<ul style="list-style-type: none"> *Know how to identify solids, liquids and gases. *Know how to give reasons to justify why something is a solid, liquid or gas.

	<ul style="list-style-type: none"> *Know how to name and describe the properties of solids, liquids and gases. *Know that melting and freezing are opposite processes that change the state of a material and give everyday examples. *Know that materials melt/freeze at different temperatures and how their melting points vary. *Know the melting points of some materials from my observations. *Know that heating causes evaporation and that cooling causes condensation and give everyday examples of evaporation and condensation. *Know how to explain why there is condensation on the inside of a hot water cup but on the outside of an icy cold water cup. *Know and can describe what happens to water at the different stages of the water cycle. *Using my data, I know how to explain what affects how quickly a solid melts. *Know how to take accurate measurements using a thermometer. *Know how to explain how to speed up or slow down evaporation. *Know how to present my learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet.
Year 5	<ul style="list-style-type: none"> * 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. * Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. * Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. * Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. * Demonstrate that dissolving, mixing and changes of state are reversible changes. * 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.
Key indicators	<ul style="list-style-type: none"> *Know how to explain the everyday uses of different materials based on their properties and state *Know how to sort and compare materials according to their properties *Know that dissolving is when the particles of a solid mix with the particles of a liquid. The result is a solution. *Know that materials that dissolve in water are soluble. Materials that do not dissolve are insoluble. *Know how to investigate factors which affect the speed of dissolving and explain my results. *Know the names of the equipment used for filtering and sieving. *Know how to use my knowledge of solids, liquids and gases to suggest how materials can be recovered from solutions or mixtures by evaporation,

	<p>filtering or sieving.</p> <p>*Know how to describe simple reversible and irreversible changes to materials, giving examples.</p> <p>*Know how to explain results from investigations involving irreversible change.</p>
Year 6	
Key Stage 3	<p>*Chemical reactions as the rearrangement of atoms.</p> <p>* Representing chemical reactions using formulae and using equations.</p> <p>*Combustion, thermal decomposition, oxidation and displacement reactions.</p> <p>*Defining acids and alkalis in terms of neutralisation reactions.</p> <p>*The pH scale for measuring acidity/alkalinity; and indicators</p>

Rocks and Soils	
	National Curriculum Statements in red are from other linked topics
Early Learning Goal	*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.
Year 1	<p>* Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)</p> <p>* Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)</p> <p>*Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)</p> <p>*Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)</p>
Year 2	* Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)
Year 3	* Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.

	<ul style="list-style-type: none"> * Describe in simple terms how fossils are formed when things that have lived are trapped within rock. * Recognise that soils are made from rocks and organic matter.
Key indicators	<ul style="list-style-type: none"> *Know that there are three types of rocks that are formed naturally *Know the difference between natural and man-made rocks. *Know how to identify the physical features of different rocks. *Know how to explain how a fossil is formed. *Know that soil is composed of four different types of matter – pieces of rock, minerals, decaying plants and water. *Know how to classify rocks in a range of ways using scientific vocabulary. *Know how to test properties of rocks. *Know how to explain, using simple scientific language, how soil is formed and identify plant/animal matter in soil. *Know how to test water retention of soils
Year 4	
Year 5	
Year 6	<ul style="list-style-type: none"> *Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)
Key Stage 3	<ul style="list-style-type: none"> * The composition of the Earth. * The structure of the Earth. * The rock cycle and the formation of igneous, sedimentary and metamorphic rocks.

	Light
	National Curriculum Statements in red are from other linked topics
Early Learning	*Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate

Goal	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.
Year 1	<ul style="list-style-type: none"> * Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 -Animals, including humans) * Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials)
Year 2	
Year 3	<ul style="list-style-type: none"> * Recognise that they need light in order to see things and that dark is the absence of light. *Notice that light is reflected from surfaces. * Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. *Recognise that shadows are formed when the light from a light source is blocked by an opaque object. * Find patterns in the way that the size of shadows change
Key indicators	<ul style="list-style-type: none"> *Know how to describe how we see objects in the light. *Know how to describe dark as the absence of light. *Know that I need light to see things in the dark. *Know that the Moon is not a source of light even though we can see it in the dark. *Know that the Sun can be harmful to our eyes and can explain why. *Know how to explain how light travels in straight lines. *Know how to define transparent, translucent and opaque. *Know how a shadow is formed. *Know how shadows change shape as the light source moves. *Know how to predict which materials will be more/less visible.
Year 4	
Year 5	<ul style="list-style-type: none"> • 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. (Y5 - Properties and changes of materials)
Year 6	<ul style="list-style-type: none"> *Recognise that light appears to travel in straight lines. *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.

	<ul style="list-style-type: none"> * 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. * Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
Key indicators	<ul style="list-style-type: none"> *Know how to demonstrate and conclude that light travels in a straight line, either from sources or reflected from other objects into our eyes. *Know that objects that block light (are not fully transparent) will cause shadows. *Know how to describe with diagrams and explain verbally that because light travels in straight lines past translucent or opaque objects, the shape of the shadow will be the same as the outline shape of the object.
Key Stage 3	<ul style="list-style-type: none"> * The similarities and differences between light waves and waves in matter. * Light waves travelling through a vacuum; speed of light. *The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. *Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye. * Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. * Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.

	<h2>Forces</h2>
	National Curriculum Statements in red are from other linked topics
Early Learning Goal	*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.
Key indicators	<ul style="list-style-type: none"> *Know how to play with a range of toys of varying sizes made of different materials and fit them together in different ways such as twisting, pushing, slotting or magnetism. *Know how to manipulate playdough in different ways. *Know how to choose materials fit for purpose for a boat. *Know how different surfaces and inclines affect the distance a toy car can travel.

	*Know how to predict, with support, which ramp surface and type will allow the car to travel the furthest.
Year 1	
Year 2	*Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)
Year 3	<ul style="list-style-type: none"> * Compare how things move on different surfaces. *Notice that some forces need contact between two objects, but magnetic forces can act at a distance. *Observe how magnets attract or repel each other and attract some materials and not others. *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. *Describe magnets as having two poles. * Predict whether two magnets will attract or repel each other, depending on which poles are facing
Key indicators	<ul style="list-style-type: none"> *Know how to give examples of forces in everyday life. *Know that when there is a push or a pull acting on an object it changes the motion of an object. *Know that when an object moves on a surface, the texture of the surface and the object affects how it moves. It may speed up, slow down or even make it stop. *Know that friction is a force that slows objects down. *Know that forces act in opposite directions to each other. *Know how to name a range of magnets and show how the poles repel and attract. *Know that when magnets repel, they push each other away. *Know that when magnets attract, they pull together. *Know that magnets have two poles – a north pole and a south pole. *Know how to draw diagrams using arrows to show the attraction and repulsion between the poles of magnets. *Know how to explain my results and begin to draw simple conclusions to describe how objects move on different surfaces. *Know how to use a magnet to sort and classify materials that are magnetic and non-magnetic. *Know how to use results to make predictions. *Know how to use test data to rank magnets.
Year 4	

Year 5	<ul style="list-style-type: none"> * Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. * Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. *Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect
Key indicators	<ul style="list-style-type: none"> *Know that a force causes an object to start moving, stop moving, speed up, slow down or change direction. *Know how to explain and demonstrate the effect of gravity on unsupported objects *Know that air resistance, water resistance and friction are contact forces that act between moving surfaces. They create resistance of motion. *Know examples of friction, air resistance and water resistance and can give examples of when it is beneficial to have high or low friction, water resistance and air resistance. *Know that some objects can move through water with less resistance if they are streamlined. *Know and can explain and demonstrate how different mechanisms work e.g. lever, gear, pulley, spring.
Year 6	
Key Stage 3	<ul style="list-style-type: none"> * Magnetic fields by plotting with compass, representation by field lines. * Earth's magnetism, compass and navigation. * Forces as pushes or pulls, arising from the interaction between two objects. *Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. *Moment as the turning effect of a force. * Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. * Forces measured in Newtons, measurements of stretch or compression as force is changed

	Sound
	National Curriculum Statements in red are from other linked topics
Early Learning	*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

Goal	changes.
Year 1	*Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 -Animals, including humans)
Year 2	
Year 3	
Year 4	<ul style="list-style-type: none"> *Identify how sounds are made, associating some of them with something vibrating. *Recognise that vibrations from sounds travel through a medium to the ear. *Find patterns between the pitch of a sound and features of the object that produced it. * Find patterns between the volume of a sound and the strength of the vibrations that produced it. * Recognise that sounds get fainter as the distance from the sound source increases
Key indicators	<ul style="list-style-type: none"> *Know how to describe different types of objects producing different sounds and that that when the object vibrates, a sound is made. *Know that sound needs something to travel through. This is called a medium such as solids, liquids and gases. *Know that the pitch of a sound is how high or low it is. *Know the volume of a sound is how loud or quiet it is *Know how to find patterns between pitch and volume and the features of the object producing the sound. *Know that sounds get fainter as the distance from the sound source increases. *Know how to explore ways to increase and decrease the pitch and volume of a sound. *Know that sound is measured in the following ways: Amplitude, Decibels and Frequency.
Year 5	
Year 6	
Key Stage 3	<ul style="list-style-type: none"> * Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition. * Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. * Sound needs a medium to travel, the speed of sound in air, in water, in solids. *Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound

	<p>waves are longitudinal.</p> <ul style="list-style-type: none"> *Auditory range of humans and animals. * Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. * Waves transferring information for conversion to electrical signals by microphone.
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Electricity	
	National Curriculum Statements in red are from other linked topics
Early Learning Goal	*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.
Key indicators	<ul style="list-style-type: none"> *Know different sources of light. *Know that energy can come from electricity. *Know different simple sources e.g. batteries, power from plugs. *Know how to make toys work by pressing parts or lifting flaps to achieve effects such as sound, movement or new images.
Year 1	
Year 2	
Year 3	
Year 4	<ul style="list-style-type: none"> *Identify common appliances that run on electricity. * Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. * 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. * Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.

	*Recognise some common conductors and insulators, and associate metals with being good conductors
Key indicators	<ul style="list-style-type: none"> *Know that electricity is generated using energy from natural sources such as the Sun, oil, water and wind. *Know that many household devices and appliances run on electricity. Some plug into the mains and others run on battery. *Know the names of the components in a circuit. *Know how to make a simple electrical circuit. *Know that a complete circuit is a loop that allows electrical current to flow through wires. *Know that if there is a break in the circuit, a loose connection or a short circuit, the component will not work. *Know how to identify complete and incomplete circuits. *Know how to create and control a circuit containing a switch. *Know how to identify, name and sort materials into electrical conductors or insulators. *Know how to communicate structures of circuits using drawings including a switch. *Know how to add a circuit with a switch to a DT project and demonstrate how it works.
Year 5	
Year 6	<ul style="list-style-type: none"> *Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. *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. *Use recognised symbols when representing a simple circuit in a diagram
Key indicators	<ul style="list-style-type: none"> *Know how to explain how a circuit operates to achieve particular operations, that adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. *Know that adding more bulbs to a circuit will make each bulb less bright. *Know that using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. *Know how to explain why circuits do or don't work. *Know how to use recognised circuit symbols to draw simple circuit designs. *Know how to plan electric circuit investigations to consolidate current electrical knowledge and solve particular problems. *Know how to carry out fair tests exploring changes in circuits. *Know how to make circuits that can be controlled.

Key Stage 3	<p>* Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge.</p> <p>* Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current.</p> <p>* Differences in resistance between conducting and insulating components (quantitative).</p> <p>*Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects.</p> <p>*Static electricity</p> <p>*The idea of electric field, forces acting across the space between objects not in contact.</p>
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Earth and Space	
	National Curriculum Statements in red are from other linked topics
Early Learning Goal	*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.
Year 1	<ul style="list-style-type: none"> • Observe changes across the four seasons. (Y1 - Seasonal changes) • Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)
Year 2	
Year 3	
Year 4	
Year 5	<p>*Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>*Describe the movement of the Moon relative to the Earth.</p> <p>*Describe the Sun, Earth and Moon as approximately spherical bodies.</p>

	*Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky
Key indicators	<ul style="list-style-type: none"> *Know that the Sun is a star and it is at the centre of our Solar System. *Know that there are 8 planets in our Solar System. *Know that the Sun, Earth and Moon are approximately spherical and can explain why. *Know and can show using diagrams the movement of the Earth and the moon. *Know that the Earth takes 365 and a quarter days to orbit the Sun. Due to the extra quarter day, every four years on Earth is a leap year. *Know and can explain that day and night is due to the rotation of the Earth. *Know how to explain why night and day occur at different times in different places on Earth. This is the reason we have time zones. *Know how to explain evidence gathered about the position of shadows in terms of movement of the Earth. *Know that as the Earth rotates, shadows that are formed change in size and orientation. *Know that the Moon has different phases depending on where it is in its orbit. *Know that when the Moon passes between the Sun and Earth, the shadow cast by the Moon falls on the Earth's surface and we can no longer see the Sun. This is called a solar eclipse.
Year 6	
Key Stage 3	<ul style="list-style-type: none"> * Gravity force, weight = mass x gravitational field strength (g), on Earth $g=10$ N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). * Our Sun as a star, other stars in our galaxy, other galaxies. *The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. *The light year as a unit of astronomical distance

