



## Science Curriculum Year 3 and 4 – Cycle A

### Purpose of study

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.

### Aims

The national curriculum for science aims to ensure that all pupils:

- ♣ develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- ♣ develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- ♣ are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

### 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 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.

**Attainment targets** - By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
<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 to a range of audiences in a variety of ways.</p> <p>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. ‘Working scientifically’ 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 guidance, examples show how scientific methods and skills might be linked to specific elements of the content. 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>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>‘Working scientifically’ must 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. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.</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.</p> <p>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. ‘Working and thinking scientifically’ 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 the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly.</p>

**Working Scientifically - 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.

<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"> <li>♣ asking simple questions and recognising that they can be answered in different ways</li> <li>♣ observing closely, using simple equipment</li> <li>♣ performing simple tests</li> <li>♣ identifying and classifying</li> <li>♣ using their observations and ideas to suggest answers to questions</li> <li>♣ gathering and recording data to help in answering questions.</li> </ul>	<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"> <li>♣ asking relevant questions and using different types of scientific enquiries to answer them</li> <li>♣ setting up simple practical enquiries, comparative and fair tests</li> <li>♣ making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>♣ gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</li> <li>♣ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>♣ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>♣ using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>♣ identifying differences, similarities or changes related to simple scientific ideas and processes</li> <li>♣ using straightforward scientific evidence to answer questions or to support their findings.</li> </ul>	<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"> <li>♣ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>♣ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>♣ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>♣ using test results to make predictions to set up further comparative and fair tests</li> <li>♣ 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</li> <li>♣ identifying scientific evidence that has been used to support or refute ideas or arguments</li> </ul>
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**Plants**

**Plants**

<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify and name a variety of common wild and garden plants, including deciduous and of a variety of common flowering plants, including trees.</li> </ul> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ observe and describe how seeds and bulbs grow into mature plants</li> <li>♣ find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>♣ 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</li> <li>♣ investigate the way in which water is transported within plants</li> <li>♣ explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul>	
<p><b>Animals including Humans</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>♣ identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>♣ describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</li> <li>♣ identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</li> </ul> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ notice that animals, including humans, have offspring which grow into adults</li> <li>♣ find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>♣ describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> </ul>	<p><b>Animals including Humans</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ 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</li> <li>♣ identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ describe the simple functions of the basic parts of the digestive system in humans</li> <li>♣ identify the different types of teeth in humans and their simple functions</li> <li>♣ construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>	<p><b>Animals including Humans</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ describe the changes as humans develop to old age.</li> </ul> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>♣ recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>♣ describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul>
<p><b>Everyday Materials</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ distinguish between an object and the material from which it is made</li> <li>♣ identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>♣ describe the simple physical properties of a variety of everyday materials</li> <li>♣ compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> </ul>	<p><b>Rocks</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>♣ describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>♣ recognise that soils are made from rocks and organic matter.</li> </ul>	<p><b>Properties and changes of Materials</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ 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</li> <li>♣ know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>♣ use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>♣ give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>♣ demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>♣ 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.</li> </ul>
<p><b>Uses of Everyday Materials</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>♣ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul>	<p><b>Light</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ recognise that they need light in order to see things and that dark is the absence of light</li> <li>♣ notice that light is reflected from surfaces</li> <li>♣ recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>♣ recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>♣ find patterns in the way that the size of shadows change.</li> </ul>	<p><b>Light</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ recognise that light appears to travel in straight lines</li> <li>♣ 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</li> <li>♣ 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</li> <li>♣ use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>
<p><b>Seasonal Changes</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ observe changes across the four seasons</li> <li>♣ observe and describe weather associated with the seasons and how day length varies.</li> </ul>	<p><b>Forces and Magnets</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ compare how things move on different surfaces</li> <li>♣ notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>♣ observe how magnets attract or repel each other and attract some materials and not others</li> <li>♣ 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</li> <li>♣ describe magnets as having two poles</li> </ul>	<p><b>Earth and Space</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li>♣ describe the movement of the Moon relative to the Earth</li> <li>♣ describe the Sun, Earth and Moon as approximately spherical bodies</li> <li>♣ use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul>

	♣ predict whether two magnets will attract or repel each other, depending on which poles are facing.	
<b>Living Things and their habitats</b> Pupils should be taught to: ♣ 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.	<b>Living Things and their habitats</b> Pupils should be taught to: ♣ 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.	<b>Living Things and their habitats</b> Pupils should be taught to: ♣ 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. Pupils should be taught to: ♣ 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.
	<b>States of matter</b> Pupils should be taught to: ♣ 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.	<b>Forces:</b> Pupils should be taught to: ♣ 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.
	<b>Sound</b> Pupils should be taught to: ♣ 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.	<b>Evolution and Inheritance</b> Pupils should be taught to: ♣ recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago ♣ recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents ♣ identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
	<b>Electricity</b> Pupils should be taught to: ♣ 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.	<b>Electricity</b> Pupils should be taught to: ♣ 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.

**Non- Negotiables**

W1: Ask relevant questions. W2: Set up simple, practical enquiries and comparative and fair tests. W3: Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. W4: Gather, record, classify and present data in a variety of ways to help in answering questions.

W5: Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. W6: Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. W7: Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. W8: Identify differences, similarities or changes related to simple, scientific ideas and processes. W9: Use straightforward, scientific evidence to answer questions or to support their findings.

**Vocabulary:** Investigation, enquiry, what to change, what we used, what we did, what we found out Investigation, enquiry, prediction, variable, dependent variable, independent variable, constant, patterns, equipment, apparatus, method, results, conclusion

	<b>Autumn</b>		<b>Spring</b>		<b>Summer</b>	
	<b>How do we keep ourselves healthy?</b> Animals including humans – Nutrition, teeth and food chains	<b>How do we see things?</b> Light	<b>How are rocks formed?</b> Rocks	<b>How do plants grow by themselves?</b> Plants – structure, functions and plant life cycle.	<b>How do magnets interact?</b> Forces- Magnets	<b>How have humans impacted on the environment?</b> Living things and their habitats
<b>Hierarchies</b>	<u><b>Understand Animals and Humans</b></u> B5: Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat.	<u><b>Investigate Light and Seeing</b></u> P7: Recognise that they need light in order to see things and that dark is the absence of light. P8: Notice that light is reflected from surfaces.	<u><b>Rocks and Soils</b></u> C1: Compare and group together different kinds of rocks on the basis of their simple, physical properties.	<u><b>Understanding plants</b></u> B1: Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers.	P2: Notice that some forces need contact between two objects, but magnetic forces can act at a distance.	<u><b>Investigate Living Things classification</b></u> B6: Construct and interpret a variety of food chains, identifying, produces, prey and predators.

	B9: Identify the different types of teeth in humans and their simple functions.	P9: Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. P10: Recognise that shadows are formed when the light from a light source is blocked by a solid object. P11: Find patterns in the way that the size of shadows change.	C2: Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). C3: Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. C4: Recognise that soils are made from rocks and organic matter.	B4: Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	P3: Observe how magnets attract or repel each other and attract some materials and not others. P4: 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. P5: Describe magnets as having two poles. P6: Predict whether two magnets will attract or repel each other, depending on which poles are facing.	B10: Recognise that living things can be grouped in a variety of ways. B11: Explore and use classification keys. B12: Recognise that environments can change and that this can sometimes pose dangers to specific habitats.
<b>Resources</b>	Model of teeth, skeleton model, body, Eat Well Plate, model/fabric internal organs, Xrays (teeth, bones etc) bone samples (animals), Small pieces of card, red and white plasticine, <b>I Know Why I Brush my Teeth</b> by Kate Rowan. Cola, milk, water, orange juice, blackcurrant juice, vinegar. 6 hard-boiled eggs, 6 screw top jars. Materials to make posters. Access to internet.	Feely bags, 5 objects to place inside them- for example, an orange, a shell, a pine cone, bubble wrap, pumice stone, a dice, an avocado or cotton wool, torches, reflective and non-reflective materials to test, mirrors, coloured card/paper for UV investigation, range of materials to test making shadows - cotton, cling film, net curtains, voile, upholstery fabric, blackout curtain lining, muslin, tracing paper.	Pipettes, beakers, stop watches, graded sieves, range of rocks, fossil samples, plasticine, petroleum jelly/Vaseline, plaster of Paris, chocolate, tweezers, crisps, cocktail sticks,	Dried beans, cotton wool, water, clear pots/jars, celery, food dye, plastic cups/beakers, paper towels, life-cycle of plant diagrams/models, flowers to dissect, magnifying glasses, tweezers		Images of animals and their habitats, trowel, magnifying glasses, classification keys (UK animals), digital cameras, access to internet,
<b>Vocabulary</b>	Bones, muscles, skull, ribs, skeleton, support, protection Mouth, tongue, teeth, canine, incisor, molar, milk teeth, gums, oesophagus, stomach, small intestine, large intestine, herbivore, carnivore, omnivore, data, table, tally, carbohydrates, proteins, dairy, fats, sugars, vitamins, minerals, fibre, growth, repair, health, energy, decay, plaque, fair test, dependent variable, independent variable	light, source, dark, reflect, see, illuminate, mirror, light, smooth, shiny, rays, rough visible smooth, shiny, rays, rough, scatter, reverse, beam, sun, beneficial, dangerous, glare, bright, damage, UV light, UV rating, visible spectrum, pupil, retina, protect, direct, sunglasses, hat, brim, travel, straight, opaque, translucent, transparent, block, shadow.	Sandstone, limestone, granite, marble, pumice, slate, crystals, properties, permeable / impermeable, hardness, sedimentary, igneous, metamorphic, fossils, soil, organic matter, humus	Air, light, water, soil, nutrients, reproduction, seed formation, dispersal, germination, pollination, transportation, species, location (photosynthesis)	magnetic, attract, repel, poles (north / south) friction, resistance	Habitat, characteristic, group, sort, organism, criteria, vertebrates, invertebrates, mammals, amphibians, insects, reptiles, fish and birds, snails, slugs, worms, spiders, insects, environment, exo skeleton, adaptation
<b>Flashback</b>	<ul style="list-style-type: none"> <li>The names of animals from the 5 groups of vertebrates.</li> <li>Common characteristics for animals from each group.</li> <li>Carnivores eat meat, herbivores eat plants and omnivores eat both.</li> </ul>	<ul style="list-style-type: none"> <li>A habitat is a place where living things live. This is where they find shelter and food.</li> <li>Examples of habitats include, the forest, the desert, the arctic tundra, the ocean.</li> <li>The 4 teeth types are canines, molars, incisors and wisdom.</li> </ul>	<ul style="list-style-type: none"> <li>Animals are suited to different habitats.</li> <li>Animals and plants have specific characteristics to help support them in the environment that they live in</li> <li>Acidic food and drink can cause tooth decay.</li> <li>The 5 main food groups are fruits/vegetables, carbohydrates, protein, dairy, oils and spreads</li> </ul>	<ul style="list-style-type: none"> <li>Light travels in straight lines as a wave and can be reflected off surfaces.</li> <li>Light from the sun can be dangerous and sun cream and sun glasses can protect us.</li> <li>Rock types include igneous sedimentary and metamorphic (with explanations of how they are formed).</li> </ul>	<ul style="list-style-type: none"> <li>Shadows are formed when a light source is blocked by a solid object.</li> <li>Fossils are formed when an animal or plant dies and it is quickly buried in sediment</li> <li>Soil is made from rocks and organic matter.</li> </ul>	<ul style="list-style-type: none"> <li>The main parts of a flowering plant are the roots, stem, leaves and flowers. (Children should define the function of these.)</li> <li>The main parts of a flower are the petals, stamen, carpe, style, stigma and pollen.</li> <li>Magnetic forces can act at a distance.</li> </ul>
<b>Lesson 1</b>	<p><b>WALT:</b> recognise diets of different people</p> <p><b>Activities:</b> What is diet? What is nutrition? What do animals eat? Recap carnivores, herbivores or omnivores. Use data to <i>answer - How much sugar is in your client's daily diet at the moment?</i> They should complete a table and draw a bar graph. <i>How many portions of fruit and vegetables a day is your client eating at the moment?</i> They should complete a table and draw a bar graph using support resources to help.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>the definitions of the terms diet and nutrition.</li> <li>how to review data from a food survey to answer a question on the consumption of either sugar or 5 a day portions.</li> </ul>	<p><b>WALT:</b> recognise that we need light in order to see things and that dark is the absence of light</p> <p><b>Activities:</b> What is light? – sorting light sources and non-light sources. Explain light sources and some examples. Sorting pictures – light sources or not. Then discuss trickier ones i.e. the moon, foil, mirror. What is dark? Feely bag activity – it's dark inside the bag – what could they contain? How can we get light into the bag?</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>a range of light sources.</li> <li>why objects are not light sources (moon, mirror etc).</li> <li>that we need light to see things, and that dark is the absence of light.</li> </ul>	<p><b>WALT:</b> know naturally occurring rocks and identify their uses.</p> <p><b>Activities:</b> Children will learn where rocks come from, then consider differences between naturally occurring rocks and man-made objects which are similar to rocks. They will then identify, describe and/or sort rocks and man-made objects.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>that rocks are used for a variety of purposes</li> <li>some common rocks</li> <li>some rocks that are naturally occurring and those that are man-made</li> </ul>	<p><b>WALT:</b> know the main parts of a flowering plant.</p> <p><b>Activities:</b> Have a selection of flowering plants in the class for the children to observe/dissect enabling them to identify the key parts of a flowering plant. They can then accurately draw and label their chosen plant (this must be an accurate observational drawing)</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>the name the main parts of a flowering plant</li> <li>how to draw and label a flowering plant</li> </ul>	<p><b>WALT:</b> know how magnetic forces work.</p> <p><b>Activities:</b> Children will learn that some forces do not need contact between objects, including gravity and magnetism. They will then find out what magnets are and how they work before testing how magnets behave when they are put together.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>that there are forces between magnets and that don't need contact between two objects</li> <li>how to record observations of magnets</li> </ul>	<p><b>WALT:</b> identify a variety of habitats and explore why organisms live in different habitats.</p> <p><b>Activities:</b> Children will identify habitats, and consider why their conditions are important for the animals living in them. They will then either describe habitats in their own words, or explore a local habitat.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>what a habitat is</li> <li>a variety of habitats</li> <li>that animals live in habitats that are suited to their needs</li> </ul>

	<ul style="list-style-type: none"> <li>how to display data in tables and bar charts and use these to look for patterns and trends.</li> </ul>				<ul style="list-style-type: none"> <li>what happens when magnets are put together</li> </ul>	
Lesson 2	<p><b>WALT:</b> know the 5 food groups and the proportions of each needed to create a healthy, balanced diet</p> <p><b>Activities:</b> What do we need to eat to stay healthy? What are the food groups? Model Eat Well Plate. Investigate the amounts of each type of food needed to be eaten to stay healthy.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>the names of the 5 main food groups</li> <li>the proportions required for each food group.</li> <li>know water is also an important part of a balanced diet.</li> </ul>	<p><b>WALT:</b> investigate which surfaces reflect light most effectively</p> <p><b>Activities:</b> Discuss the characteristics of reflective surfaces. Explain how mirrors are made and the image reflected is reversed. Discussing and testing reflective materials to use the best materials to produce a reflective book bag/T-Shirt</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>what reflection is</li> <li>some reflective materials.</li> <li>the best reflective material for a purpose.</li> </ul>	<p><b>WALT:</b> group rocks according to their characteristics</p> <p><b>Activities:</b> Children will consider ways in which rocks can be sorted according to different criteria. They may then either sort given rock samples, or study and sort pictures of rocks according to various criteria.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>ways of grouping rocks according to their characteristics</li> <li>how to observe and compare rocks, and put them into different categories, describing them using scientific vocabulary</li> </ul>	<p><b>WALT:</b> identify and describe the functions of the roots of flowering plants.</p> <p><b>Activities:</b> Children will recap the main features of flowering plants, then learn about how roots grow, and what their functions are. They will then plan an experiment where they will grow beans, measuring root growth.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>the main parts of flowering plants</li> <li>the function of roots</li> <li>how to record findings and draw conclusions</li> </ul>	<p><b>WALT:</b> identify magnetic materials.</p> <p><b>Activities:</b> Children will recap how magnets behave when they are put together before testing a variety of objects to see if they are magnetic. Children will make predictions based on their prior knowledge then carry out an investigation to check if their predictions were correct.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>whether materials are magnetic or not</li> <li>how to make careful observations</li> </ul>	<p><b>WALT:</b> group organisms according to their characteristics.</p> <p><b>Activities:</b> Children will organise animals into groups according to some of their characteristics. They may then either continue to sort animals according to some of their own criteria, or examine some animals and group them based on observations.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>similarities and differences between similar organisms</li> <li>how to group animals and explain the criteria that has been used to sort them</li> <li>the characteristics of different organisms</li> </ul>
Lesson 3	<p><b>WALT:</b> know that humans have different types of teeth and explain their functions</p> <p><b>Activities:</b> Look at models of teeth or sets of teeth. – Give children mirrors and allow time for looking at and feeling their own teeth. Ask How many teeth have they got? How many new ones (permanent teeth)? How many baby teeth (milk teeth)? Why do they lose their milk teeth? Can they count their teeth? Discuss milk teeth. Make models of their teeth using plasticine.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>the 4 different types of teeth</li> <li>what each type of tooth does</li> </ul>	<p><b>WALT:</b> use a mirror to reflect light and explain how mirrors work</p> <p><b>Activities:</b> Recap features of reflective materials and the characteristics of reflective surfaces. Explain how mirrors are made and the image reflected is reversed. Mirror games - 1) children should use a mirror to write a short reversed message to their partner. They should then swap messages and try to decipher them with their mirrors, 2) children will attempt to walk along a wavy line while looking only in a mirror held overhead. They will find it tricky because of the apparent reversal of left and right when looking in the mirror</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>why mirrors are good reflectors.</li> <li>how to use a mirror to reflect light</li> <li>how mirrors work</li> </ul>	<p><b>WALT:</b> plan, carry out and evaluate experiments to compare rocks.</p> <p><b>Activities:</b> Children will start to learn about erosion. They will also consider how different rocks may be tested to determine how quickly they erode and whether they are permeable. Following this, children will conduct practical erosion/permeability investigations.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>what the terms ‘erosion’ and ‘permeable’ mean</li> <li>how to plan and carry out an experiment to compare rocks based on certain characteristics</li> <li>how to evaluate their results and draw conclusions</li> </ul>	<p><b>WALT:</b> identify and describe the functions of leaves in flowering plants.</p> <p><b>Activities:</b> Children will start to learn how plants make their own food using air and sunlight. They will then either describe parts of this process in their own words, or plan and conduct an experiment to show the importance of light for plant growth.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>what plants need to produce their own food</li> <li>the function of leaves in flowering plants</li> <li>some stages in the life cycle of flowering plants</li> </ul>	<p><b>WALT:</b> know how the magnetic poles interact with one another.</p> <p><b>Activities:</b> Children will use magnets to investigate and record in a table how the magnetic poles interact with one another.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>that magnets have two poles.</li> <li>that opposite poles attract and the same poles repel.</li> </ul>	<p><b>WALT:</b> classify animals into specific groups according to their characteristics.</p> <p><b>Activities:</b> Children will use classification keys to identify and sort animals into groups. They may also study a range of sources to find out about a particular group of animals.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>that animals can be categorised into broad groups according to their characteristics</li> <li>how to use a classification key to help them identify which group an animal belongs to</li> <li>a variety of animals that are vertebrates, invertebrates, mammals, amphibians, insects, reptiles, fish and birds</li> </ul>
Lesson 4	<p><b>WALT:</b> know that our diet and lifestyle can impact the health of our teeth.</p> <p><b>Activities:</b> In this session we are going to look at the importance of keeping our teeth healthy. Look at structure of a tooth. - Explain we are going to investigate – <u>Which liquid does the least damage to eggshells?</u> Plan investigation - Model setting up the class experiment.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>the structure of a tooth</li> <li>how to make an investigation fair</li> <li>how to make predictions</li> </ul>	<p><b>WALT:</b> recognise that light from the sun can be dangerous and that there are ways to protect our eyes</p> <p><b>Activities:</b> Children carry out an investigation on the effects of UV light on coloured card to highlight the dangers of UV light. Learn about the dangers of looking directly at the sun and use of sunglasses.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>what UV light is</li> <li>about the dangers of UV light</li> <li>ways to protect our eyes from the sun.</li> </ul>	<p><b>WALT:</b> identify rocks and explain how their properties make them used for particular purposes.</p> <p><b>Activities:</b> Children will consider what sources may help them find out about a rock’s uses, then carry out research to help them describe the characteristics of rocks and their uses.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>the uses of rocks and why they are suited to their purpose</li> <li>how to organise the information they have found out</li> </ul>	<p><b>WALT:</b> explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p><b>Activities:</b> Children will start to identify the parts of a flower, and how pollination occurs. They will then continue to identify and label the parts of a flower by drawing diagrams or dissecting flowers.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>the main parts of flowers</li> <li>the functions of the main parts of flowers</li> <li>ways in which flowering plants reproduce</li> </ul>	<p><b>WALT:</b> set up a comparative test to test the strength of magnets.</p> <p><b>Activities:</b> Children will set up a comparative test to see if the strength of a magnet affects how it behaves with magnetic materials, considering if it will pull an object from further away.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>that stronger magnets will attract objects from further away</li> <li>magnets can attract objects through other materials.</li> </ul>	<p><b>WALT:</b> use a classification key to identify animals.</p> <p><b>Activities:</b> Children will identify a range of animals from different environments using classification keys. Optionally, they may create and test their own classification keys.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>how to use a classification key to identify unfamiliar animals</li> <li>how to use close observations to identify an animal’s characteristics</li> </ul>

			<ul style="list-style-type: none"> <li>how to present the information they have found out clearly</li> </ul>	<ul style="list-style-type: none"> <li>how and where seeds are formed in flowering plants</li> </ul>		<ul style="list-style-type: none"> <li>how to create their own classification keys to help identify an animal</li> </ul>
Lesson 5	<p><b>WALT:</b> know how to keep our teeth healthy</p> <p><b>Activities:</b> Chn will have been looking at the jars throughout the week (without removing the tops). Tap the eggshells with a metal spoon, encourage chn to describe: smells like... looks like... feels like... (for those brave enough, let them touch the eggs). Working in pairs and drawing on what they have learned, discuss why they think the effects of the liquids on the eggshells are different. Are there any surprises in the results? Can we make any links about the effect these liquids might have on tooth enamel?</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>acidic food and drink can cause tooth decay.</li> <li>how to look after their teeth to prevent tooth decay</li> <li>how to draw conclusions from observations.</li> </ul>	<p><b>WALT:</b> recognise that shadows are formed when the light from a light source is blocked by a solid object</p> <p><b>Activities:</b> Investigate materials which would make good black out curtains to block out light from a baby's bedroom</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>how light travels.</li> <li>how to sort different materials according to whether they are opaque, transparent or translucent.</li> </ul>	<p><b>WALT:</b> explore soil and how it is formed.</p> <p><b>Activities:</b> Children will learn about soil: how it is formed and its uses. They will also study different types of soil. Following this, children will study and describe a variety of soil samples.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>that soil is made up of rocks and decaying organic matter</li> <li>know that there are different types of soil</li> <li>that there are different layers of soil</li> </ul>	<p><b>WALT:</b> explore some of the ways in which flowering plants disperse their seeds.</p> <p><b>Activities:</b> Children will learn how the ovaries of flowering plants grow to form seeds, and how they may be dispersed in a variety of ways. They will then either continue to study in-depth some ways in which seeds are dispersed, or identify seeds found outside.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>why flowering plants need to disperse their seeds</li> <li>some ways in which seeds are dispersed</li> <li>how seeds are dispersed based on their appearance</li> </ul>	<p><b>WALT:</b> investigate uses for magnets.</p> <p><b>Activities:</b> Children will recap different magnetic materials and make generalisations about which materials are not magnetic. They will then find out about a variety of uses for magnets, including medical equipment, credit cards and recycling. There is also the chance to carry out their own research to find out about different uses for magnets.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>some uses for magnets</li> <li>how to use a variety of sources to find out about the different uses of magnets</li> <li>how to present the information they have found in an appropriate way</li> </ul>	<p><b>WALT:</b> identify and classify a variety of British plants.</p> <p><b>Activities:</b> Children will use Venn Diagrams and Carroll diagrams to sort plants according to some of their characteristics. Some children may choose their own ways of sorting and classifying plants, too.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>a variety of plants according to their characteristics</li> <li>how to use a classification key to identify plants</li> <li>how to use other sources to help them identify a variety of local plants</li> </ul>
Lesson 6		<p><b>WALT:</b> find patterns in the way that the size of shadows changes</p> <p><b>Activities:</b> Children will be investigating what happens when you change the distance between the object and the light source</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>how a shadow is formed.</li> <li>how to plan and set up an investigation</li> <li>why shadows change in size</li> </ul>	<p><b>WALT:</b> explore what fossils are and how they are formed.</p> <p><b>Activities:</b></p> <p>Children will learn about how fossils are formed, then either describe this process in their own words or conduct a practical, 'fossil-making' activity.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>that rocks move in a continuous cycle</li> <li>know what a fossil is</li> <li>how fossils are formed</li> </ul>	<p><b>WALT:</b> know the structure of seeds and their importance as a food source.</p> <p><b>Activities:</b> Children will learn about the structure of seeds and how plants grow from them. They will then either taste and compare seeds, or make seed cake bird feeders.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>the parts of a seed and describe their functions</li> <li>why seeds are an important food source for animals</li> </ul>	<p><b>WALT:</b> suggest and design creative uses for magnets.</p> <p><b>Activities:</b> Based on uses the children already know about they will design a use for magnets in the real world and present their invention in a dragon's den format.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>how to use scientific concepts and ideas to solve problems.</li> <li>how to present their ideas and explain them using their scientific findings.</li> </ul>	<p><b>WALT:</b> explore the human impact on habitats and environments.</p> <p><b>Activities:</b> Children will consider ways in which animals living in environments are affected by human behaviour, then suggest ways in which we can help protect and sustain habitats.</p> <p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>how one change in a habitat can affect all the organisms within that environment</li> <li>positive ways in which humans can impact the environment</li> <li>negative ways in which humans can impact the environment</li> </ul>
Knowledge	<p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>The 4 teeth types are canines, molars, incisors and wisdom.</li> <li>Acidic food and drink can cause tooth decay.</li> <li>The 5 main food groups are fruits/vegetables, carbohydrates, protein, dairy, oils and spreads</li> </ul>	<p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>Light travels in straight lines as a wave and can be reflected off surfaces.</li> <li>Light from the sun can be dangerous and sun cream and sun glasses can protect us.</li> <li>Shadows are formed when a light source is blocked by a solid object.</li> </ul>	<p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>Rock types include igneous sedimentary and metamorphic (with explanations of how they are formed).</li> <li>Fossils are formed when an animal or plant dies and it is quickly buried in sediment</li> <li>Soil is made from rocks and organic matter.</li> </ul>	<p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>The main parts of a flowering plant are the roots, stem, leaves and flowers. (Children should define the function of these.)</li> <li>The main parts of a flower are the petals, stamen, carpel, style, stigma and pollen.</li> <li>Plants reproduce through pollination and seeds are dispersed by the wind, water, bursting or attached to animals.</li> </ul>	<p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>Magnetic forces can act at a distance.</li> <li>Opposite magnetic poles attract, the same poles repel one another.</li> <li>Magnetic materials are always made from metal but not all metals are magnetic.</li> </ul>	<p><b>Children will know:</b></p> <ul style="list-style-type: none"> <li>Construct and interpret a variety of food chains, identifying, produces, prey and predators.</li> <li>Living things can be grouped in a variety of ways and we can use classification keys to help us sort them.</li> <li>Environments can change and that this can sometimes pose dangers to specific habitats.</li> </ul>