



Cycle A	Autumn		Spring		Summer
KS1	Seasonal Changes (Autumn and Winter)	Everyday materials	Animals Including Humans (Long unit)	Seasonal Changes (Spring and Summer)	Plants
LKS2	Rocks	Animals including Humans	Light	Forces and Magnets	Plants
UKS2	Light	Animals including Humans	Evolution and Inheritance	Electricity	Living things and their habitats
Cycle B	Autumn		Spring		Summer
KS1	All living things and their habitats	Uses of Everyday Materials	Animals Including Humans		Plants
LKS2	Animals including Humans	States of Matter	Electricity	Sound	Living things and their habitats
UKS2	Earth and Space	Living things and their habitats	Properties and changes of materials	Forces	Animals, including humans

New Science Curriculum - LKS2 - Cycle A (Y3 Objectives)

LKS2 WS Vocabulary	Working Scientifically (WS)	Ways of Working Scientifically
<p>Fair Test Systematic Accurate Results Conclusion Processes</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 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 • using straightforward scientific evidence to answer questions or to support their findings. <p>Non-Statutory</p> <ul style="list-style-type: none"> • Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. • They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. • They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. • They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. 	<ul style="list-style-type: none"> • Observing changes over time • Looking for naturally occurring patterns or relationships • Identifying, classifying and grouping • Researching using secondary sources • Comparative and fair testing • Making things and developing systems • Investigating models

- They should learn how to use new equipment, such as data loggers, appropriately.
- They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.
- They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.
- Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.

These opportunities for working scientifically should be provided across years 3 and 4 so that the expectations in the programme of study can be met by the end of year 4. Pupils are not expected to cover each aspect for every area of study.

Vocabulary	Rocks		WS - Investigations and Skills
<p><u>Tier 2</u> Formation Properties</p> <p><u>Tier 3</u> Fossil Organic Soil Humus Layers Natural</p> <p><u>Additional</u> Magma Lava Sedimentary Igneous Metamorphic Topsoil Subsoil Weathered Bedrock Peat Clay Chalk Sand Weathering</p>	<p>Statutory Knowledge and Understanding Objectives</p> <ul style="list-style-type: none"> I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties (1 and 2) I can describe in simple terms how fossils are formed when things that have lived are trapped within rock. (3) I can recognise that soils are made from rocks and organic matter. (4 and 5) <p>Non-Statutory</p> <ul style="list-style-type: none"> Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment. Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed. 	<p>Sequence of Lessons and Intended Knowledge (KNOWLEDGE)</p> <p>1. Observe different types of rocks and their uses</p> <p>Vocabulary to describe rocks - hard, soft, rough, smooth, crumbly, layers, colours, crystals and porous.</p> <p>Group rocks based on appearance and characteristics</p> <p>Some rocks allow water to pass through and some rocks change in water.</p> <p>Name everyday uses of different rocks</p> <p>Know what rocks we can find locally</p> <p>2. Learn about different types of rocks</p> <p>How different rocks are formed</p> <p>There may be discussion of sedimentary, igneous and metamorphic but language does not need to be remembered at this stage</p> <p>3. Understand what a fossil is</p> <p>How fossils are formed from animal remains.</p> <p>Fossils can be pieces of animals/plants, but they can also be imprints - bones, leaves, footprints, eggs and droppings.</p> <p>Possibility to study Mary Anning</p> <p>4. Classify different types of weathering</p> <p>5. Describe what soils are made of</p> <p>Soils contain different types of rock and organic matter.</p> <p>Soil is made up of multiple layers, including topsoil, subsoil, weathered rocks and bedrock.</p>	<ul style="list-style-type: none"> Question - Ask/answer questions Observation and Exploration - Crayon Rock investigation Observation - Fossils and collection of soil samples Exploration - how fossils are formed - not just dead animals - imprints/droppings etc. - playdough, biscuits, clay, plaster of Paris. Research - secondary sources Grouping and Classifying - types rocks based on properties Comparative testing and Exploration - rocks in water - skills of predictions and conclusions. Simulate a fossil dig Use of magnifying glasses/digi-scopes. Investigate - layers of soil and the effect of water
			<p>Links to Writing</p> <ul style="list-style-type: none"> Narrative - Finding a fossil or a dinosaur becoming a fossil Report - different rock types Descriptive language to describe rocks
<p>Scientists</p> <p>Mary Anning William Smith</p>			<p>Links to Maths</p> <ul style="list-style-type: none"> Collect data about rocks Tables to record and present results Measure - time - related to fossils

Vocabulary	Animals, Including Humans		WS - Investigations and Skills
<p><u>Tier 2</u> Support Protection</p> <p><u>Tier 3</u> Nutrition Skeleton Muscle Movement Diet Food group</p> <p><u>Additional</u> Bones X-ray Skull Tendon Ligament Marrow Cartilage Voluntary Involuntary Omnivore Herbivore Carnivore Nutrient Carbohydrate Protein</p>	<p>Statutory Knowledge and Understanding Objectives</p> <ul style="list-style-type: none"> I can identify that humans and some other animals have skeletons and muscles for support, protection and movement. (1,2 and 3) I can 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 (4, 5 and 6) <p>Non-Statutory</p> <ul style="list-style-type: none"> Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy and design meals based on what they find out. 	<p>Sequence of Lessons and Intended Knowledge (KNOWLEDGE)</p> <ol style="list-style-type: none"> Be introduced to the skeleton and identify the main bones in our body. To know that animals (including humans) have a skeleton. The 3 functions (support, movement, protection) of the skeleton and without a skeleton, humans would lack support - e.g. jellyfish (hydro skeleton) Discuss the function of different bones in our body and compare to some animal skeletons. Identify and name some bones of the human skeleton (skull, ribcage - protect. thighbone, kneecap tibia and fibula -movement and backbone - support.) Learn about how voluntary and involuntary muscles work To know that muscles work in pairs, and contract and relax to allow movement. Explore the different food groups and identify ways to eat a balanced diet Children to know different food groups and their uses (carbohydrates, fruits and vegetables, minerals and vitamins, fats and oils, dairy and protein.) To name some foods in each of the food groups. Understand the difference between herbivores, carnivores and omnivores Compare the diets of different animals, including pets <p>Humans cannot make their own food - contrast with plants.</p>	<ul style="list-style-type: none"> Question - Ask/answer questions Exploration - food groups Investigating models - skeleton Identify - bones and muscles in the body Grouping - types of animals Exploring and Observing - movement Compare - diets Research - secondary sources <p>Links to Writing</p> <ul style="list-style-type: none"> Letter - Write a letter to parents to explain what they need in their lunches to be healthy. <p>Links to Maths</p> <ul style="list-style-type: none"> Sorting Venn/Carroll Diagrams Tables to record and present findings
<p>Scientists</p> <p>Marie Curie</p>			

Vocabulary	Light		WS - Investigations and Skills
<p><u>Tier 2</u> Travel Source</p> <p><u>Tier 3</u> Light Dark Sun Reflect Eye Shadow</p> <p><u>Additional</u> Opaque Transparent Protection Factor Fluorescent</p>	<p>Statutory Knowledge and Understanding Objectives</p> <ul style="list-style-type: none"> I can recognise that they need light in order to see things and that dark is the absence of light (1) I can notice that light is reflected from surfaces (2) I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes (3) I can recognise that shadows are formed when the light from a light source is blocked by a solid object (4) I can find patterns in the way that the size of shadows change. (5) <p>Non-Statutory</p> <ul style="list-style-type: none"> Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. 	<p>Sequence of Lessons and Intended Knowledge (KNOWLEDGE)</p> <ol style="list-style-type: none"> Explore the difference when it is light and dark To know that we need light to see To know what a light source is - natural sources and manmade sources and that the moon is not a light source. (it reflects light). Know that light can only travel in a straight line and that light is reflected from surfaces. Explain how reflective surfaces keep us safe To know that some (shiny) surfaces reflect light better than others. Explore how light is reflected from a mirror (understand this is a good reflective surface). Recognise that light from the sun can be dangerous and that there are ways to protect our eyes Recognise how a shadow is formed To know that materials can be - opaque, translucent, transparent. To know that a shadow is formed when light is blocked by an opaque material. Discover what might cause shadows to change 	<ul style="list-style-type: none"> Question - Ask/answer questions Exploration - reflective surfaces/creating shadows Comparative and Fair testing - distance of light source and object - size of shadows - skills of predictions and conclusions. Pattern seeking - shadows Observation - reflections and what we can see in the dark without light Equipment - use of data loggers
Scientists			Links to Writing
Ibn al-Haytham			<ul style="list-style-type: none"> Non-chronological report - different uses of light - natural and artificial.
			Links to Maths
			<ul style="list-style-type: none"> Measure - time and distance Tables to record and present findings Shape - angles (where appropriate)

Vocabulary	Forces and Magnets		WS - Investigations and Skills
<p><u>Tier 2</u> Force Surface</p> <p><u>Tier 3</u> Magnetic Magnet Attract Repel Pole Material</p> <p><u>Additional</u> North South Friction Compass Needle Direction</p>	<p>Statutory Knowledge and Understanding Objectives</p> <ul style="list-style-type: none"> I can notice that some forces need contact between two objects, but magnetic forces can act at a distance (1) I can compare how things move on different surfaces (2) I can observe how magnets attract or repel each other and attract some materials and not others describe magnets as having two poles (3 and 4) I can predict whether two magnets will attract or repel each other, depending on which poles are facing. (3 and 4) I can 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 (5) <p>Non-Statutory</p> <ul style="list-style-type: none"> Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe). Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets. 	<p>Sequence of Lessons and Intended Knowledge (KNOWLEDGE)</p> <p>1. Explore different forces To know that friction is caused when two surfaces move across each other To know that a push, pull force needs contact between the two objects and that magnetic forces do not need any contact.</p> <p>2. Explore and compare how objects move on different surfaces To know that a rough surface creates more friction and a smooth surface creates less friction.</p> <p>3. Learn about different types of magnets and observe how they react with different materials Magnets have different forms (bar, horse shoe, ring and button.) To explore different magnets to identify their strengths.</p> <p>4. Explore how the different poles of magnets react to each other. Magnets have a north and a south pole</p> <p>5. Explore how magnets react to different materials To know that magnets will attract some materials and not others. To group everyday materials by their magnetic qualities. To know that not all metals are magnetic.</p> <p>6. Know that magnetic needles always point magnetic north Understand the use of magnets in everyday objects</p>	<ul style="list-style-type: none"> Question - Ask/answer questions Identify - Poles Observation and Exploration - toy car on different surfaces and effects/uses of magnets Comparative and Fair testing - materials and, use of magnets of different materials, types of magnets, distance of an object from a magnet - skills of predictions and conclusions. Grouping and classifying - materials based on whether they are magnetic or not. Pattern seeking
Scientists			Links to Writing
<p>Michael Faraday</p>			Links to Maths
			<ul style="list-style-type: none"> Measurement - Distance Direction - North and South Tables to present and record findings

Vocabulary	Plants		WS - Investigations and Skills
<p>Tier 2 Function Formation</p> <p>Tier 3 Nutrient Transported Reproduction Pollination Dispersal Survival</p> <p>Additional Stem Roots Leaves Flowers Xylem Phloem Moss Fertilisation</p>	<p>Statutory Knowledge and Understanding Objectives</p> <ul style="list-style-type: none"> I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers (1) I can 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 (2) I can investigate the way in which water is transported within plants (3) I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (4 and 5) <p>Non-Statutory</p> <ul style="list-style-type: none"> Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens. Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers. <p>Note: refer to Human Development and Reproduction in the Primary Curriculum document for further guidance.</p>	<p>Sequence of Lessons and Intended Knowledge (KNOWLEDGE)</p> <ol style="list-style-type: none"> Identify different parts of a flowering plant Know that plants make their own food Explain the functions of each part of a plant - roots draw water and nutrients, stem/trunk provides support, leaves help the plant make its own food and flowers ensure reproduction Explore the requirements for different plants to grow successfully Plants need air, light, water, nutrients and room to grow Investigate how water is transported through the plant To describe/discuss why/how roots spread throughout the soil, why/how stem and roots circulate water and nutrients around the plant. Understand how plants and seeds reproduce and grow including pollination To know that flowers are structured in a way to attract bees and insects and that these are central to the plant reproducing. To name the key parts of a flower that are important to reproduction - (petal, pistil, stamen, stigma, style, ovary, ovule, anther, filament and sepal). Understand seed dispersal 	<ul style="list-style-type: none"> Question - Ask/answer questions Identify and observe - parts and functions of a plant - use of lilies and Digi scope Comparative and Fair testing - needs of a plant - prediction, conclusion and measurement skills. Different amounts of light/water, planted in different ways e.g. sand, soil, cotton wool. Exploration - Transportation of water - celery/lilies/carnations Pattern seeking Observation - videos - pollination, seed formation and seed dispersal
Scientists			Links to Writing
<p>Tim Smit George Washington Carver</p>			<p data-bbox="1637 1018 2145 1066" style="background-color: #00b0f0; color: white;">Links to Maths</p> <ul style="list-style-type: none"> Measure - growth Tables to record and present findings