

Great Gaddesden Church of England (VA) Primary School



Science Curriculum

Statement of Intent:

At Great Gaddesden School, Science is an integral part of our inclusive and engaging curriculum.

Children develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.

They develop an understanding of the nature, processes and methods of science through different types of child-led science enquiries that help them to answer scientific questions about the world around them.

All children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Our aim is to deliver high-quality teaching and learning opportunities that enable all children to achieve their personal best whilst developing the potential to question, challenge and explore.

Aims:

The curriculum for science at Great Gaddesden 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.

Key Themes:

EYFS:

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

KS1:

- **Working Scientifically**

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: 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

- **Animals including Humans**

Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

- **Everyday Material**

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.

- **Plants**

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 Seasonal Changes Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.

- **Materials**

Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses to find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

- **Plants (Light & Dark)**

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.

- **Plants (Bulbs & Seeds)**

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.

- **Living things and their habitats**

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.

- **Growing Up**

Notice that animals, including humans, have offspring which grow into adults

LKS2:

- **Working scientifically**

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: 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.

- **Plants**

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.

- **Animals, including humans - Y3**

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.

- **Animals, including humans - Y4**

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.

- **Rocks**

Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock and recognize that soils are made from rocks and organic matter.

- **Light**

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.

- **Forces and magnets**

Compare how things move on different surfaces notice that some forces need contact between 2 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 2 poles predict whether 2 magnets will attract or repel each other, depending on which poles are facing

- **Living Things & their habitats**

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.

- **States of matter**

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.

- **Sound**

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.

- **Electricity**

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

UKS2

Working Scientifically

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: 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 degree of trust in results, in oral and written forms such as displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments.

- **Earth & space**

Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Describe the movement of the Moon relative to the Earth. Describe the Sun, Earth and Moon as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.

- **Forces**

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.

- **Properties & changes of materials**

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.

- **Living things & their habitats**

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.

- **Animals, including humans**

Describe the changes as humans develop to old age.

- **Light**

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. 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.

- **Electricity**

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.

- **Living things & their habitats**

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.

- **Evolution & inheritance**

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.

- **Animals, including humans**

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.

Science Long-Term Overview

Cycle A 23/24; 25/26

Year group(s)	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Early Years	<p>Understanding the world</p> <p>Noticing signs of Autumn</p> <p>Noticing signs of Autumn using the senses</p> <p>Explore the natural world around them. Describe what they see, hear and feel whilst outside. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p> <p>Differences between ourselves and others Animals focus on humans Senses Body parts Growth from baby to toddler, child, adult</p>	<p>Beginning to understand the rules of using interactive whiteboard</p> <p>Understanding the basic rules of keeping safe using ICT</p>	<p>Noticing and commenting on the changes to the immediate environment</p> <p>Identifying Earth within the Solar System and confidently describing the sun and moon</p> <p>Exploring light and colour – effects of light, absence of light etc. Using mirrors – exploring reflection Sc1 Gathering and recording data Identify and classify Observing Questioning Using simple equipment Fair testing Performing simple test</p>	<p>Recognises and confidently talks about the signs of Spring</p> <p>Talking about the differences between animals from different parts of the world</p> <p>Life cycles and Growth Planting seeds Sc1 Gathering and recording data Identify and classify Observing Questioning Using simple equipment Fair testing Performing simple test Explore the natural world around them. Describe what they see, hear and feel whilst outside. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them. Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the</p>	<p>Identifying past and present events in their own lives</p> <p>Understanding key ingredients for healthy growing and recognising changes over time</p> <p>Operating simple apps for a desired purpose</p> <p>Operating simple programmable toys</p>	<p>knowing what makes them the same and different to others</p> <p>Recognising festivals celebrated by other cultures and religions</p> <p>Talking about the impact of changes in the future and how to manage these</p> <p>Selecting the appropriate ICT device for desired purpose</p> <p>Understanding the basic rules of keeping safe using ICT</p>

				seasons and changing states of matter.		
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KS1

Year 1: Observe changes across the four seasons						
Year group(s)	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1 & 2	<p>Everyday Materials (Y2)</p> <p><u>Lesson 1 - Explore Wood, paper and cardboard.</u> Look at the materials wood, paper and cardboard in greater detail. Understand that paper and cardboard are made from trees. Perform simple tests on each material to learn more about its structure and properties. Try to change the shape of the material through folding, tearing or squashing. Identify the simple properties of each material and discuss their suitability for a range of uses. Identify when a material is suitable as well as unsuitable for a purpose. Working scientifically Performing simple tests. Key question Which words would you use to describe wood/paper/cardboard? Vocabulary material natural material – man-made material recycle</p> <p><u>Lesson 2 - Explore brick and rock</u> Understand that rocks are a natural material found on and underneath the Earth’s surface and that brick is a man-made building material.</p>	<p>Everyday Materials (Y2)</p> <p><u>Lesson 5 - Same object, different material</u> Explore real-life examples and discuss why a material is suitable for a particular purpose. Identify when a material would be unsuitable for a purpose and give simple reasons why. Use appropriate vocabulary when explaining why a material is suitable or not suitable for a purpose. Working scientifically Using their observations and ideas to suggest answers to questions. Key question Why is plastic a good material for a child’s toy? Vocabulary Shiny Dull Rigid tough Brittle hard soft flexible</p> <p><u>Lesson 6 - Test materials - bend, squash, twist and stretch</u> Carry out simple tests to discover whether they can change the shape of a solid material through bending, squashing, twisting and stretching. They do not need to understand why the materials they are testing are classified as solid materials. Use simple</p>	<p>Living Things and their Habitats (Y2)</p> <p><u>Lesson 1 - Habitats in the school grounds</u> Investigate a habitat in their local area and collect data about the different plants and animals that live there. Identify that a habitat provides a plant or animal with everything that is essential for life. They do not need to identify microhabitats in this step as this is covered later in the block. Working scientifically Gathering and recording data to help in answering questions. Key question What is a habitat? Vocabulary mammal bird deciduous tree evergreen tree habitat</p> <p><u>Lesson 2 - Look at animals and plants that live in polar habitats - Arctic and Antarctica.</u> Identify some animals and plants that are able to survive in these</p>	<p>Animals including Humans The Human Body (Y1)</p> <p><i>Recap: What parts of the human body can you name?</i></p> <p><u>Lesson 1 - Name and identify the parts of the human body.</u> Identify and label the neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth. Carry out an experiment to investigate the question: Do the oldest children have the longest feet? Working scientifically Using their observations and ideas to suggest answers to questions. Key question Where are parts of the human body? (neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth) Vocabulary Hair Eye Nose Mouth Elbow Leg Hand Knee Arm Neck Teeth Ear Feet <u>Lesson 2 - Sight</u> Understand that humans use their eyes to see. Look closely at their own</p>	<p>Animals including Humans (Y1)</p> <p><u>Lesson 1 - Mammals</u> Use the word “mammal” for the first time. Learn that a mammal is an animal that has fur or hair on its body. Build on this understanding and look at other characteristics of mammals, such as being warm-blooded and giving birth to live young, in later year groups. Working scientifically Asking simple questions and recognising that they can be answered in different ways. Key question What is a mammal? Vocabulary Animal mammal fur wild animal pet</p> <p><u>Lesson 2 - Birds</u> Explore and identify different birds and their features. Learn that birds have wings, a beak and feathers. Recognise that some birds can fly and some cannot. It is important that they are shown a wide range of examples, such as flightless and swimming</p>	<p>Plants (Y1) You may wish to start planting before half term in Summer 1 for full effect.</p> <p><u>Lesson 1 - Name and identify parts of a plant</u> Name the roots, stem, leaves and flowers, including the petals, of a flowering plant. Children are not required to learn the functions of each plant part, as these are covered in LKS2. Working scientifically Identifying and classifying. Key question What are the key parts of a plant? Vocabulary Flower petals leaf stem roots</p> <p><u>Lesson 2 - Identify and name tree parts.</u> They should identify the roots, trunk, branches, leaves and fruit. Ensure that they see a variety of different trees, either in images or living. They should identify key similarities and differences between the trees. Encourage them to compare trees and other plants. Ensure that children are aware that trees are plants. Working scientifically Identifying and classifying. Key question What are the key parts of a tree? Vocabulary</p>

Year 1: Observe changes across the four seasons

<p>They should be introduced to the terms “rock”, “pebble” and “stone” when describing rocks. <i>Children do not need to name and identify rocks, as this is covered within the LKS2 curriculum. Simply differentiate between buildings made from brick and rock.</i></p> <p>Working scientifically Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them.</p> <p>Key question What are the similarities/differences between brick & rock?</p> <p>Vocabulary material smooth rough flexible rigid</p> <p><u>Lesson 3 - Explore glass and plastic</u> Look at the use of glass and plastic in everyday life and identify similarities and differences between the two materials. Use the terms “transparent”, “translucent” and “opaque” to describe materials. Include opportunities to think about sustainability within this step, as they can look at how glass and some plastic can be recycled. Glass objects such as beads or marbles should be used.</p> <p>Working scientifically Asking simple questions and recognising that they can be answered in different ways.</p> <p>Key question What does “transparent”/” translucent”/” opaque” mean?</p> <p>Vocabulary rock stone Pebble Brick material</p>	<p>tables to record data from their investigations.</p> <p>Working scientifically Performing simple tests.</p> <p>Key question If a solid material changes shape, can it change back to its original shape?</p> <p>Vocabulary Squash Bend Stretch twist</p> <p><u>Lesson 7 - Plan Waterproof experiment</u> Discuss that the material for an umbrella needs to be waterproof, lightweight and strong. Use planning sentence stems...</p> <p>I think the will be the best material.</p> <p>I think this because</p> <p>We will change the</p> <p>We will keep the same.</p> <p>We will measure the.....</p> <p>Learn how to use the experiment equipment correctly.</p> <p>Working scientifically Asking simple questions and recognising that they can be answered in different ways.</p> <p>Key question Which material do you predict will be the best for an umbrella and why?</p> <p>Vocabulary Independent dependent Controlled variable</p> <p><u>Lesson 8 - Investigate - waterproof experiment</u> Carry out a comparative test to explore which material would be the best for an umbrella. Recap that an umbrella needs to be lightweight, waterproof and strong. Carry out simple investigations on the materials before testing to see if they are waterproof. This could include pulling, twisting or tearing the material to test its strength. If the material breaks during this</p>	<p>extreme conditions. Explore simple reasons why polar animals can survive in such extreme temperatures. This can include layers of blubber or fat and thick fur to keep them warm during colder months. Understand that polar animals get everything they need to survive from their habitat.</p> <p>Working scientifically Using their observations and ideas to suggest answers to questions.</p> <p>Key question What animals live in the artic/Antarctic</p> <p>Vocabulary carnivore herbivore artic plants habitat hibernate</p> <p><u>Lesson 3 - : Desert Habitat</u> Compare the differences between polar and desert animals and identify any differences between the animals that live in these habitats. Explore how plants survive in desert habitats with a focus on familiar plants, such as cacti.</p> <p>Working scientifically Using their observations and ideas to suggest answers to questions.</p> <p>Key question What is the weather like in the desert?</p> <p>Vocabulary Reptile cactus desert habitat rainfall</p> <p><u>Lesson 4 - Ocean Habitat</u> Explore the habitats of ocean animals. Name</p>	<p>eyes to identify their eye colour and any similarities and differences between their eyes and the eyes of others. Perform simple tests to investigate sight. Repeat investigations, each time limiting their ability to see. Discuss whether this influences the outcome of the task.</p> <p>Working scientifically Performing simple tests.</p> <p>Key question Which body part do you use to see?</p> <p>Vocabulary Eyes light dark blind</p> <p><u>Lesson 3 - Sound</u> Identify that humans use their ears to hear sounds. Identify the source of a sound played to them and develop their vocabulary to describe different sounds. Complete a sound walk around school. List the different sounds they can hear. Which are loud? Which are quiet? Model the vocabulary associated with the description of sound</p> <p>Working scientifically Performing simple tests.</p> <p>Key question Which body part do you use to hear?</p> <p>Vocabulary Ears hear quiet loud noisy</p> <p><u>Lesson 4 - Taste</u> Look at their mouths to identify the teeth and tongue. Understand that their tongue helps them to taste food.</p>	<p>birds.</p> <p>Working Scientifically Gathering and recording data to help in answering questions.</p> <p>Key question What features do all birds have?</p> <p>Vocabulary Bird beak feathers wing flipper webbed feet</p> <p><u>Lesson 3 -Fish</u> Explore different types of fish and their features. Learn that fish live in water, have fins to help them swim and most have scales on their bodies. They also learn that most fish breathe with gills.</p> <p>Working Scientifically Identifying and classifying.</p> <p>Key question What features do fish have?</p> <p>Vocabulary Fish fin tail scales gills</p> <p><u>Lesson 4 - Amphibians</u> Explore different amphibians and their features. This may be the first time children are introduced to the word “amphibian”. Learn that an amphibian is an animal that lives both on land and in water. Adult amphibians spend most of their life on land, usually in damp habitats. Introduce children to common amphibians such as frogs, newts and toads.</p> <p>Working Scientifically Identifying and classifying.</p> <p>Key question Where do amphibians live?</p>	<p>Leaf branch trunk roots fruit</p> <p><u>Lesson 3 - Name and identify common wildflowers and garden plants.</u> They identify that wildflowers are plants that grow naturally in the countryside, such as bluebells, buttercups, daisies, dandelions and nettles. Garden plants, such as sunflowers and roses, are planted in a garden by humans and looked after by them. <i>Health & Safety Take care with plants, as some may be poisonous or cause allergic reactions.</i></p> <p>Working scientifically Observing closely, using simple equipment.</p> <p>Key question What is the difference between a wild and garden plant?</p> <p>Vocabulary Wildflower daisy sunflower garden plant</p> <p><u>Lesson 4 - Plant Hunt</u> Children use their knowledge of common garden and wildflowers to identify plants in the school grounds/local area. Images of familiar plants from the previous step could be used to help them name the plants they see. Children should identify any familiar species and could count the number of plants they identify. Encourage children to use hand lenses to closely observe the plants and tell them to avoid touching or picking plants. Health & Safety Take care with plants, as some may be poisonous or cause allergic reactions.</p> <p>Working scientifically Gathering and recording data to help in answering questions.</p> <p>Key question What plants grow in our school grounds?</p> <p>Vocabulary</p>
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Year 1: Observe changes across the four seasons

	<p><u>Lesson 4 - Explore Metals</u> Understand that there are different types of metal that are suitable for different uses. They do not need to test whether metals are magnetic.</p> <p>Working scientifically Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them.</p> <p>Key question Are all metals silver?</p> <p>Vocabulary Brittle flexible transparent translucent opaque</p>	<p>testing, it will need to be replaced before testing to see whether it is waterproof. <i>Next Steps: You will look at rocks in more detail in LKS2.</i></p> <p>Working scientifically Using their observations and ideas to suggest answers to questions.</p> <p>Key question Which material would be the best for an umbrella?</p> <p>Vocabulary waterproof Strong Breakable light</p>	<p>some familiar animals and plants in oceans and seas. Understand that ocean plants provide some animals with their dietary needs. They are also used for shelter or safety from larger predators. Identify why these animals and plants are best suited to ocean habitats and give simple explanations of how they rely on each other to survive.</p> <p>Working scientifically Identifying and classifying.</p> <p>Key question Are all animals that live in seas and oceans and fish.</p> <p>Vocabulary Ocean fish mammal seagrass habitat</p> <p><u>Lesson 5 - Woodland Habitat</u> Identify animals and plants that live in woodland habitats. Visit woodland area to allow children to identify plants and animals in their natural habitat. Identify why these animals and plants are best suited to woodland habitats and give simple explanations of how they rely on each other to survive.</p> <p>Working scientifically Identifying and classifying.</p> <p>Key question How do animals use the plants and trees in the woodland to survive?</p> <p>Vocabulary Woodland fern mammal</p>	<p>Understand that there are five basic tastes – sweet, salty, bitter, sour and savoury. Provide opportunities to sample food from each of these five tastes.</p> <p>Working scientifically Performing simple tests</p> <p>Key question What are the five tastes?</p> <p>Vocabulary Sweet sour salty bitter savoury</p> <p><u>Lesson 5 - Touch</u> Understand that skin covers the human body and touch can be sensed at any point on the body through contact with the skin. Perform simple tests to investigate touch. Explore touch using body parts other than just their hands.</p> <p>Working scientifically Performing simple tests.</p> <p>Key questions Is it easier or harder to touch when you wear gloves? Why?</p> <p>Vocabulary Skin rough smooth hard soft</p> <p><u>Lesson 6 - Smell</u> Identify that the nose is used to sense smells. Carry out practical activities such as smell walks or tasks to describe and identify a range of smells. Order, sort and group smells. Experiment removing more dominant senses such as sight can affect other senses.</p> <p>Working scientifically Performing simple tests.</p> <p>Key question</p>	<p>Vocabulary Amphibian frog toad newt webbed feet</p> <p><u>Lesson 5 -Reptiles</u> Explore reptiles and their features. Learn that a reptile is an animal that has dry scales on its body. Children will build on this understanding and look at other features of reptiles in later year groups, such as being coldblooded and laying eggs.</p> <p>Working Scientifically Using their observations and ideas to suggest answers to questions.</p> <p>Key question What features do reptiles have?</p> <p>Vocabulary reptile scales lizard crocodile turtle</p> <p><u>Lesson 6 - Compare & Group animals</u> Identify and group animals into categories based on their features. Compare the different features between groups of animals and also look at similarities between groups.</p> <p>Working Scientifically Identifying and classifying.</p> <p>Key question What is similar about mammals/birds/fish /amphibians and reptiles?</p> <p>Vocabulary Mammals bird fish amphibians reptile</p> <p><u>Lesson 7 - Carnivores, herbivores & omnivores</u> Introduce the words carnivore, omnivore & herbivore. Learn about</p>	<p>Wildflower nettle buttercup dandelion garden plant</p> <p><u>Lesson 5 - Deciduous trees</u> Introduce the term “deciduous” for the first time. There is no onus on children to read or write the word deciduous. They should identify that deciduous trees lose their leaves in autumn. Encourage children to make links to previous Seasonal changes blocks when discussing deciduous trees. Ensure that children can observe a variety of common deciduous trees using the schools grounds. These could include horse chestnut, oak and sycamore trees. It may be useful to look at the leaf structure of the different trees, focusing on their appearance.</p> <p>Working scientifically Identifying and classifying.</p> <p>Key question What are deciduous trees and can you recognise and name some?</p> <p>Vocabulary Deciduous tree oak horse chestnut sycamore (include names of trees in school grounds)</p> <p><u>Lesson 6 - Evergreen trees</u> (Holly & pine) Introduce the word “evergreen” - used to describe trees that keep their leaves all year round. Earlier in this block, children identified the parts of different trees, labelling the roots, trunk, branches, leaves, flowers and fruit. During this step, children explore the “needle-like” leaf structure of some evergreen trees and how these trees differ from the deciduous trees studied so far.</p> <p>Working scientifically Identifying and classifying.</p> <p>Key question What are ever green trees and can you recognise and name</p>
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Year 1: Observe changes across the four seasons						
			<p>bird moss</p> <p><u>Lesson 6 - Micro Habitats</u> Explore microhabitats - refers to an extremely small habitat. For example, a woodlouse lives beneath stones, logs or leaf litter. Explore a variety of microhabitats and identify the animals and plants that inhabit them. Comprehend that smaller creatures are more likely to thrive in microhabitats and consider which animals or plants are unlikely to be found in such tiny environments. Working scientifically Observing closely, using simple equipment. Key question What is a microhabitat? Vocabulary Microhabitat insect spider snail habitat</p> <p><u>Lesson 7 - Habitats & Diet</u> Consider the habitats different animals live in and think about how this will affect their diets. Working scientifically Gathering and recording data to help in answering questions. Key question Where do most animals find their food? Vocabulary Carnivore herbivore omnivore habitat diet</p> <p><u>Lesson 8 - Draw food chains</u> Use knowledge about carnivores, herbivores</p>	<p>Is it easier or harder to name the object using only your sense of smell? Vocabulary Nose smell sniff stench scent</p>	<p>specific characteristics commonly associated with carnivores including speed, strength and sharp teeth and claws. Understand that omnivores, herbivores and carnivores' range in size. Learn that herbivores are animals that eat plants. They have sharp teeth for eating other animals and flat teeth for chewing plants. <i>Next steps: In cycle B you'll learn about how animals live in different places in the world e.g. polar animals / desert animals.</i> Working Scientifically Identifying and classifying. Key question What do carnivores, omnivores and herbivores eat? Vocabulary omnivore carnivore herbivore plants animals wild animals pets</p>	<p>some? Vocabulary Evergreen pine holly needles</p> <p><u>Lesson 7 - Plants in your local area</u> Pre-plan which local area you will visit and the route you take to get there to ensure that children can observe a variety of familiar trees from this block. Children may need to be reminded to look closely at the shape of the leaves on each tree, because many trees will have green leaves at this time of year. Working scientifically Using their observations and ideas to suggest answers to questions. Key question What trees grow in our local area? Vocabulary Deciduous tree Evergreen leaf needles</p>

Year 1: Observe changes across the four seasons						
			<p>and omnivores when creating food chains.</p> <p>Working scientifically Gathering and recording data to help in answering questions.</p> <p>Key question What is a food chain?</p> <p>Vocabulary Food chain carnivore omnivore herbivore diet</p> <p><u>Lesson 9 - : Living, dead or never alive?</u> Explore and compare the differences between things that are living, things that are dead and things that have never been alive. <i>Next Steps: You will learn more about habitats in Yr4 and how humans are impacting them.</i></p> <p>Working scientifically Identifying and classifying.</p> <p>Key question What are some examples of things that are alive/dead/never been alive?</p> <p>Vocabulary Living dead never alive plant animal</p>			

Year group(s)	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3 & 4	<p>Forces and Magnets (Y3) <i>Recap: In KS1, you explored how materials could be changed. How can materials change shape?</i></p> <p>Lesson 1 - Exploring Forces Children are introduced to forces for the first time. Children should define forces simply as a push or a pull. Categorise examples of a force as a push or pull and be given the opportunity to exert forces themselves. To prepare children for investigating magnetism, it is important to introduce push and pull forces as “contact forces”. Working Scientifically Identifying differences, similarities or changes related to simple scientific ideas and processes. Key Question How can we describe a force? Vocabulary Push pull force contact force</p> <p>Lesson 2 - Friction Recall that forces are pushes and pulls, and a contact force affects objects that are touching. Friction should be introduced as a contact force which pushes against a moving object. Demonstrate that friction works in the opposite direction to the moving object, show objects stopping slowly on a smooth surface and stopping quickly on a rough surface. Working Scientifically Using straightforward scientific evidence to answer questions or to support their findings. Key Question What is friction?</p>	<p>Electricity (Y4) Lesson 1 - Common appliances that use electricity <i>Recap: This is the first time you have learned about electricity, but do you know some safety rules about electricity?</i></p> <p>Understand that electricity is a way of moving the energy needed to power appliances. Identify common appliances that use electricity. Learn that appliances can either be plugged into the mains at a socket or powered by cells or batteries. Think about how they could group different appliances. Look at some of the dangers of electricity and how it can be extremely harmful. Identify ways to keep safe when using electrical appliances. Working scientifically Talk about criteria for grouping, sorting and classifying (non-statutory). Key Question What is electricity? Vocabulary Appliances plug socket cell electrocution</p> <p>Lesson 2 - Build and draw series circuits Build working circuits and explore the role of each part in these circuits. Draw circuits created using pictorial representations and think carefully about how they represent each object. Children do not need to use conventional circuit symbols until Year 6, but they should think about how they can make</p>	<p>Living Things and their habitats (Y4) <i>Recap: In KS1 you learnt about different habitats. What do we mean by ‘habitat’</i></p> <p>Lesson 1 - Living Things Investigation Investigate the plants and animals within their locality, and how biodiverse these local habitats are. They should explore the differences between urban and rural habitats and how each type meets the needs of the plants and animals that live there. Children should compare this with their local habitat and consider how biodiverse each location is. Working Scientifically Asking relevant questions and using different types of scientific enquiries to answer them. Key Question Why is it important to have good biodiversity in a habitat? Vocabulary Habitat rural habitat urban habitat biodiversity</p> <p>Lesson 2 - Classification of keys animals Continue to explore and create classification keys with increasing independence. When creating their classification keys, children must create closed questions that can be answered using “yes” or</p>	<p>States of Matter (Y4) <i>Recap: In KS1 you learned about the different properties of materials such as wood, metal and glass. Why are objects made of different materials?</i></p> <p>Lesson 1 - Explore solids, liquids, gases. Introduction to materials and objects which can be grouped into solids, liquids and gases. Look at the properties of solids, liquids and gases and relate these to the common uses of the materials. Explore the similarities and differences between solids, liquids and gases. Learn that solids have a defined shape and a fixed volume. Understand that a solid material will keep its shape if it is transferred from one container to another. Learn that liquids keep the same volume when they are poured into different containers. Understand that gases move to fill any space available, so will move in and out of open windows and can move around the room. Working Scientifically Talk about criteria for grouping, sorting and classifying Key Question What are the properties of solids, liquids and gases? Vocabulary Solid, liquid, gas, volume, states of matter, Lesson 2 - Think differently</p>	<p>Animals including Humans - The Digestive System and Teeth (Y4) <i>Recap: In cycle B, you learnt about skeletons. Name some bones found in the human body.</i></p> <p>Lesson 1 - Teeth Build on their knowledge of animal groups, focusing on common carnivores, herbivores and omnivores. Begin to explore how an animal’s diet influences the structure of its teeth. Working Scientifically Identifying differences, similarities or changes related to simple scientific ideas and processes. Key Question How are carnivores, herbivores and omnivores teeth suited to their diet? Vocabulary Carnivore herbivore omnivore</p> <p>Lesson 2 - Human Teeth Understand why humans have more than one type of tooth. They learn the names of the four main types of teeth in the mouth. Children are introduced to the terms incisor, canine, premolar and molar teeth. <i>Watch clip from Operation Ouch Series 6 Episode 5 Terrific Teeth – the doctors reveal why you need differently shaped teeth to eat food safely - (this clip answers the KQ)</i> Working Scientifically Asking relevant questions and using different types</p>	<p>Animals including Humans - Food chains (Y4) <i>Recap: In cycle B, you explored why different animals have different types of diets. What is the difference between an omnivore, herbivore and carnivore?</i></p> <p>Lesson 1 - What is a food chain? Explore food chains and should identify the producer, consumers, prey and predators in a range of different food chains. By the end of this step, children should identify plants as producers as they get their energy from the Sun. Working Scientifically Using straightforward scientific evidence to answer questions or to support their findings. Key Question What is a food chain? Vocabulary Food chain producer predator prey consumer</p> <p>Lesson 2 - Interpret food chains Interpret what individual food chains show. Children learn that habitats have food chains of different lengths and that there can be more than one type of prey or predator in a single chain. It is important to use examples of familiar food chains to introduce</p>

	<p>Vocabulary Force friction contact force smooth rough</p> <p><u>Lesson 3 - Friction Experiment</u> Investigate how different materials affect friction, by releasing a toy car from the top of a small ramp and measuring how far it travels on each material. Provide them with at least two different materials to allow them to make comparisons.</p> <p>Working Scientifically Setting up simple practical enquiries, comparative and fair tests.</p> <p>Key Question How does the material on the ramp affect the distance a car travels?</p> <p>Vocabulary Force friction contact force smooth rough data prediction</p> <p><u>Lesson 4 - Magnets</u> Learn that magnets create a force when around other magnets or magnetic materials. Identify the north and south poles of a magnet. It is important for children to handle a range of simple magnets and observe how they interact with each other.</p> <p>Working Scientifically Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>Key Question Why is a magnetic force described as a “non-contact force?”</p> <p>Vocabulary Magnet magnetic poles iron magnetic force</p> <p><u>Lesson 5 - Magnetic and non-magnetic</u> Test different materials, both metals and nonmetals, to see if they are magnetic or non magnetic.</p>	<p>their representations as accurate as possible.</p> <p>Working scientifically Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p> <p>Key Question What is the role of each part in a working circuit?</p> <p>Vocabulary Circuit switch cell battery buzzer</p> <p><u>Lesson 3 - What has gone wrong?</u> Look at a range of circuits which do not work for different reasons, including the circuit not being a complete loop or the switch being open. Make systematic observations about this and use knowledge from previous steps to identify ways to fix the circuit. This should also be explored through diagrams. Build and fix the circuits represented in the diagrams to support understanding, if necessary.</p> <p>Working scientifically Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Key Question What might be the causes of a circuit not working?</p> <p>Vocabulary Conductor insulator metal material</p> <p><u>Lesson 4 - Conductors and insulators</u> Understand that a conductor is a material that allows energy to flow through it and an insulator is a material that does not allow energy to flow through it. Once secure with the definitions, begin to look at which materials are conductors and insulators.</p>	<p>“no”. This should be modelled to the children, because they may require support with creating these questions independently. Children may struggle to use closed questions. They may base their questions upon opinion, or ask questions that are too broad or narrow. Model the construction of closed questions. Children may incorrectly classify animals. Discuss examples of animals that are harder to categorise, before children undertake grouping and sorting activities</p> <p>Working Scientifically Gathering, recording, classifying and presenting data in a variety of ways, to help in answering questions.</p> <p>Key Question Why is it essential to only use closed questions in a classification key?</p> <p>Vocabulary Classification key closed questions vertebrate invertebrate habitat</p> <p><u>Lesson 3 - Classification keys plants</u></p> <p>Continue to develop these skills with increasing independence. They will construct a classification key using the characteristics of plants they might find in the local environment. Children may need support to ask closed questions and with structuring their classification keys. This can be done practically by working in groups to classify plants found in the local environment during Learning 1 Plants can be</p>	<p><u>about Solids, liquids & gases</u></p> <p>Explore materials that are more difficult to categorise. Explore toothpaste, shaving foam and oobleck (a mixture of corn flour and water) to challenge their thinking around how to categorise materials into each state of matter. Explore examples of materials that challenge their definitions of solids, liquids and gases. This includes solid materials that can be poured and liquids that flow slower than water such as honey, oil and treacle. Use a Venn diagram to sort materials, as they could choose to group certain materials between a solid and a liquid for example.</p> <p>Working scientifically Identifying differences, similarities or changes related to simple scientific ideas.</p> <p>Key Question Which materials are more difficult to categorise as solids, liquids or gases?</p> <p>Vocabulary pouring, solid, oobleck, flow,</p> <p><u>Lesson 3 - Changing States</u> Build on understanding of the states of matter and look at how some materials can change states between a solid, liquid and gas. The terms “evaporation” and “condensation” are introduced for the first time and these concepts will be built upon in DQ5. Understand that temperature changes can cause changes in state. Explore the concepts of melting and freezing</p>	<p>of scientific enquiries to answer them.</p> <p>Key Question What would happen if humans only had molars?</p> <p>Vocabulary Teeth incisors canines premolars molars</p> <p><u>Lesson 3 - Layers of teeth</u> Learn about the layers of the teeth. Use the terms enamel, pulp and root. Identify that enamel is the protective layer around the outside of the tooth. The pulp can be described as the sensitive inner part of the tooth and the roots hold the tooth in the jaw.</p> <p>Working Scientifically Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</p> <p>Key Question What is enamel and what does it do?</p> <p>Vocabulary Teeth germs enamel root plaque</p> <p><u>Lesson 4 and 5 - Tooth decay experiment</u> Plan and set up an investigation into the effects different liquids have on the egg. The eggs can be used to model a tooth, as the shell is made from similar materials to tooth enamel. The eggs should be added to different liquids and left over time. Understand that the shells of the eggs may become weakened by the different liquids. They should understand that germs (bacteria) in the mouth feed on sugars and</p>	<p>the fact that a consumer can be a predator, prey or both.</p> <p>Working Scientifically Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Key Question What do the arrows in a food chain show?</p> <p>Vocabulary Food chain producer predator prey consumer</p> <p><u>Lesson 3 - Draw food chains</u> Create and draw food chains. They should place producers, consumers, prey and predators in the correct order, with arrows showing the transfer of energy from the producer through to the predator. <i>Next Step: In year 5, you will find out more information about animals and explore their life cycles.</i></p> <p>Working Scientifically Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Key Question What kind of animals would consume or eat the producers?</p> <p>Vocabulary Food chain producer predator prey consumer</p>
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	<p>Make predictions before testing the materials. Materials should be sorted and grouped based on whether they are attracted by a magnet or not.</p> <p>Working Scientifically Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Key Question What do you notice about the materials that are magnetic?</p> <p>Vocabulary Magnet metal non-metal attract magnetic</p> <p><u>Lesson 6 Attract or repel</u> Identify that north and south poles on a magnet attract each other and north and north or south and south repel. They should make simple predictions on whether two magnets would attract or repel based on the position of the poles. Next Step: In Year 5, you will learn more about different forces.</p> <p>Working Scientifically Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Key Question On a magnet which poles attract/repel each other?</p> <p>Vocabulary Poles magnetic magnet attract repel</p>	<p>Working scientifically Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Key Question What is a conductor /insulator?</p> <p>Vocabulary conductor insulator metal material</p> <p><u>Lesson 5 - Conductivity within a circuit</u> Think in more detail about how a conductor/ insulator would affect a circuit. Test different materials. Children should analyse their results and think about generalisations they can make about conductors and insulators.</p> <p><i>Next Steps: You will learn more about electricity Yr6 where you will learn the scientific symbols for the parts of the circuit.</i></p> <p>Working scientifically Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Key Question What materials are conductors or insulators of electricity and is there a pattern?</p> <p>Vocabulary conductor insulator metal material</p>	<p>harder to classify than animals because children may think that plants all have similar features. Address this by showing images of different plants, for example a tree, a bush and a dandelion, and describing the differences between them.</p> <p>Working Scientifically Gathering, recording, classifying and presenting data in a variety of ways, to help in answering questions</p> <p>Key Question Can you create a classification key to identify plants that grow in the school grounds?</p> <p>Vocabulary Classification key closed questions flowering plant non flowering plant</p> <p><u>Lesson 4 - Human impact on habitats</u></p> <p>Explore human impacts on plant and animal habitats. Children should be aware that these impacts can be both positive and negative. Children should appreciate that building nature reserves and other projects, such as rewilding, provide a greater variety of habitats for plants and animals to live in. This increases biodiversity. Children should also know that humans can be responsible for the destruction of habitats, for example when extracting natural resources. Next Steps: You will learn about the world's natural resources in Geography next year.</p> <p>Working Scientifically Reporting on findings from</p>	<p>through simple hands-on activities e.g. observing an ice cube or piece of chocolate melt and freezing different liquids.</p> <p>Working scientifically</p> <p>Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Key Question How can a material change state? (e.g solid to liquid, liquid to gas etc)</p> <p>Vocabulary freezing, melting, boiling, condensation, evaporation,</p> <p><u>Lesson 4 - Investigation</u> Carry out an experiment to investigate whether the temperature of the water affects the time it takes for ice to melt. A discussion of variables before the practical experiment is essential. Children set up practical equipment and make systematic and careful observations throughout. With support, children need to identify the relationship between temperatures and melting rates. <u>Water cannot be over 50°C when children are measuring temperatures, to comply with health and safety guidelines.</u></p> <p>Working scientifically Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>Key Question How does the temperature of the water affect the time it takes for ice to melt?</p> <p>Vocabulary thermometer, stopwatch, beaker, temperature,</p> <p><u>Lesson 5 - Water cycle</u> Build on understanding of</p>	<p>produce acid which can break down the enamel on the teeth. Therefore, they should notice that liquids with a higher sugar content have a greater effect on the egg as more acid is produced which breaks the shell down similar to the enamel on teeth. Follow up on teeth experiment at a later date.</p> <p>Working Scientifically Setting up simple practical enquiries, comparative and fair tests.</p> <p>Key Question Which liquid do you predict will have the greatest effect on the egg - why?</p> <p>Vocabulary Teeth germs enamel decay plaque</p> <p><u>Lesson 6 - The digestive system</u> Explore the digestive system and the route food takes through the body, starting with the teeth. This step introduces children to the oesophagus, stomach, small intestine, large intestine and rectum. Use the scientific words for organs in the digestive system such as “intestine” and “oesophagus”</p> <p>Working Scientifically Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations</p> <p>Key Question What route does food take through the body?</p> <p>Vocabulary digestive system mouth oesophagus stomach</p>	
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UKS2

Year group(s)	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5 & 6	<p>Properties of Materials (Y5)</p> <p><i>Recap: This step builds on the electricity block studied in LKS2. What do we mean by insulators and conductors?</i></p> <p><u>Lesson 1 - Testing materials</u> Test everyday materials and group them based on their transparency, hardness and magnetism. Link the properties of materials to their uses. Working Scientifically Use and develop keys and other information records to identify, classify and describe living things and materials (non-statutory). Key Question What do ‘magnetic’, ‘translucent’, ‘transparent’ and ‘opaque’ mean? Vocabulary Transparent, translucent, opaque, magnetism, hardness</p> <p><u>Lesson 2 - Electrical Conductivity</u> Test some everyday materials and group them based on their electrical conductivity. The materials will be classified as conductors or insulators. Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, classification</p>	<p>Forces (Y5)</p> <p><i>Recap: In LKS2, you were introduced to the concept of forces and you explored friction. What does friction mean?</i></p> <p><u>Lesson 1 - Friction</u> Recap what friction is and look at the effects of friction. Understand that friction always works in the opposite direction to that in which the object is moving. Explore how friction is useful in everyday life including real-life examples, such as car tyres and the brakes on a bicycle wheel. Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas Key Question What are some examples of where friction occurs? Vocabulary Force, contact force, friction, motion,</p> <p><u>Lesson 2 - Air resistance</u> Learn that air resistance is a type of friction that occurs between air and another material. Know the effects and benefits of air resistance in everyday life. Learn how the amount of air resistance is affected by the size and shape of an object and how this is used to help us design objects. It is important that</p>	<p>Electricity (Y6)</p> <p><u>Lesson 1 - Construct and draw series circuits using symbols</u></p> <p><i>Recap: In LKS2 you learned how to build an electrical circuit. What were the components you needed to make an electrical circuit?</i></p> <p>Build on understanding of circuits to construct and draw series circuits using symbols. Build circuits alongside drawings to understand how the pictorial representation links to the physical example. Draw circuits accurately. Use a pencil, ruler and the wires of the circuit should be drawn using straight lines. Introduced to the terms ‘current’ and ‘voltage’. Understand that current is the flow of electricity and voltage is the measure of how strong the current is in a circuit Working scientifically Recording data and results of increasing complexity using scientific diagrams. Key Question What are circuit symbols? Vocabulary Series circuit Cell Battery Bulb Current Voltage</p> <p><u>Lesson 2 - Complete and Incomplete circuits</u> Look at complete and incomplete circuits. Explore reasons why a circuit may be</p>	<p>Animals Including Humans (Y5)</p> <p><i>Recap: You learned about the human body when you covered the digestive system in LKS2. How does the digestive system work?</i></p> <p><u>Lesson 1 - Learn how humans grow and develop.</u> Look at the key features of each stage of the human life cycle in this lesson. Understand that babies, children and adolescents grow rapidly in terms of mass and height. They tend to reach a peak in their growth when they become an adult. Working scientifically Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Key question What are the six stages of the human life cycle? Vocabulary Adolescent baby foetus elderly adult adult life cycle</p> <p><u>Lesson 2 - Explore key milestones in baby and child development.</u> Understand that babies are completely dependent on an adult to survive and will cry to communicate if they are hungry, uncomfortable, too hot or too cold. As a baby grows into a child most learn to walk, run, jump and eat</p>	<p>Life Cycles (Y5)</p> <p><i>Recap: In KS1 you learned what a mammal is. What features do mammals have?</i></p> <p><u>Lesson 1 - Life Cycles of mammals and humans.</u> Understand that a mammal has a similar life cycle to a human, which begins as a foetus in the mother’s womb. Explore the four main stages of the life cycle of a mammal – foetus, young, adolescent and adult. Complete a research enquiry. Discuss similarities and differences between the life cycles of humans and other mammals. Highlight to children that some mammals, called ‘monotremes’, lay eggs instead of giving birth to live young. Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify Key question What are the key characteristics of a mammal and which characteristic is different in monotreme mammals? Vocabulary Monotreme offspring mammary gland mammal life cycle</p>	<p>Reproduction (Y5)</p> <p><i>Recap: In LKS2, you learnt about the reproductive parts of a plant. Can you remember what they were called and how this linked to pollination?</i></p> <p><u>Lesson 1 - Sexual Reproduction in animals</u> Children should understand that fertilisation is the process by which a male sperm cell and female egg cell join to form a new life. They should also understand that sexual reproduction results in offspring that are not identical to the parents. Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non statutory). Key question What is fertilisation? Vocabulary Fertilisation sperm cells egg cells embryo sexual reproduction</p> <p><u>Lesson 2 - Reproductive parts in plants</u></p>

	<p>keys, tables, scatter graphs, bar and line graphs.</p> <p>Key Question What does electrical conductor /insulator mean?</p> <p>Vocabulary electrical conductor electrical insulator circuit Cell bulb</p> <p><u>Lesson 3 - To plan a heat insulating investigation</u> Plan a comparative test to investigate which material is the best thermal insulator. Investigation will test which material is the best at keeping hot water warm. Learn that a thermal insulator is a material that prevents heat passing through it. Choose three different materials, such as bubble wrap, aluminium foil and felt, to wrap around the beakers filled with hot water. Alongside this, children should have a beaker that is not wrapped in any material. This beaker provides a control that they can use to measure temperature differences against.</p> <p>Working scientifically Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Key Question What are the independent, dependent and controlled variables in this experiment?</p> <p>Vocabulary independent variable dependent variable controlled variable</p> <p><u>Lesson 4 - Conduct a heat insulating investigation</u> Carry out a comparative test to explore which materials are the best</p>	<p>children are shown a wide range of real life examples of air resistance, such as trains and aeroplanes, to ensure they do not form a misconception that air resistance only occurs when something is falling in a downward motion.</p> <p>Working scientifically Recognise which secondary sources will be most useful to research their ideas</p> <p>Key Question Why is air resistance a friction force?</p> <p>Vocabulary air resistance, drag, parachute, force,</p> <p><u>Lesson 3 - Parachute experiment</u> Plan their parachute experiment, make predictions and identify variables. Identify the experiment equipment and explain why it is used. Use the terms “dependent” and “independent variable” for the first time. Know which variables need to be controlled and why. Test at least three different surface areas for the parachutes. Look at the results. Evaluate and suggest improvements for their experiment. Children should determine that the greater the surface area of the parachute, the more air resistance acts on the parachute and hence the longer it takes to reach the ground.</p> <p>Working scientifically Using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Key Question How does the surface area of the parachute affect the amount of air resistance?</p>	<p>incomplete. Examples of this include disconnected wires, the battery terminals are the wrong way round in the holder or the switch is open. Use the term “current” when explaining whether a circuit is complete or incomplete and why components may or may not work. Understand that the current cannot flow when the circuit is incomplete. Continue to draw and build circuits throughout this step.</p> <p>Working scientifically 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.</p> <p>Key Question What happens to the current in an incomplete circuit?</p> <p>Vocabulary Complete circuit Incomplete circuit Switch Buzzer</p> <p><u>Lesson 3 - Variations within circuits</u> Explore variations within circuits and the effects of having fewer or more components. Construct a range of series circuits with varying numbers of components such as bulbs, buzzers or switches. Spot patterns between the number of components and the brightness of bulbs and loudness of buzzers. Identify that if the voltage in the circuit remains the same, but more bulbs or buzzers are added, this will dim or quieten these components</p> <p>Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, – Recording data and results</p>	<p>independently. Most also communicate by talking and eventually learn to read and write.</p> <p>Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Key question Do all babies hit milestones at the same age?</p> <p>Vocabulary Milestone baby toddler child womb</p> <p><u>Lesson 3 - Understand puberty as the process of changing from a child to an adult.</u> Puberty prepares humans for reproduction. Learn that puberty can happen at any time between age 8 and 16 and they explore the key changes that happen to humans throughout puberty.</p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas</p> <p>Key question What is puberty?</p> <p>Vocabulary Adolescent period reproduce puberty hormone</p> <p><u>Lesson 4 -Explore the key changes that happen to humans in adulthood and late adulthood.</u> Learn that a human is categorised as an adult from the age of 18 and by this point rapid growth will have slowed down. The body is fully developed and ready to reproduce.</p> <p>Working scientifically Identifying scientific evidence that has been used</p>	<p><u>Lesson 2 - Explore the life cycle of amphibians, with a focus on frogs.</u> Children learnt about amphibians in previous year groups and should be able to describe an amphibian as an animal that lives both on land and in water. Remind children that amphibians lay eggs, which usually hatch and develop in water before emerging onto land when reaching the adult stage of the life cycle. Children should explore the metamorphosis of a frog, looking at frogspawn, tadpoles, froglets and adult frogs.</p> <p>Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Key question What are the metamorphic stages of a frog?</p> <p>Vocabulary Amphibian frogspawn tadpole froglet metamorphosis metamorphic</p> <p><u>Lesson 3 - Metamorphosis</u> Explore the complete metamorphosis of different insects, such as a butterfly, honeybee and ladybird. Mention to children that some insects only go through three life stages (egg, nymph and adult) and this is called “incomplete metamorphosis”.</p>	<p><i>In LKS2, children learnt that the male parts of a flowering plant are called “stamens” and the female parts are called the “pistil”.</i></p> <p>Children learn the names and functions of the specific male and female reproductive parts in plants. The female pistil is made up of the stigma, style and ovary and the female sex cells are ovules. The male stamens are made up of the anther and filament and the male sex cells are pollen.</p> <p>Working scientifically Recording data and results of increasing complexity, using scientific diagrams and labels, classification keys, tables, scatter graphs, bar charts and line graphs.</p> <p>Key question What are the male / female sex cells in flowering plants called?</p> <p>Vocabulary Anther filament ovule stigma style ovary pollen stamen pistil</p> <p><u>Lesson 3 - Pollination</u> Explore the process of pollination in flowering plants. Learn that plants can reproduce sexually through pollination, building on their knowledge from LKS2. Children should be aware that many plants cannot pollinate</p>
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	<p>insulators of heat. Before they begin the investigation, children should be encouraged to recap their experiment plan and identify the independent, dependent and controlled variables.</p> <p>Working scientifically Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Key Question Why was one of the beakers not covered in insulation?</p> <p>Vocabulary thermal insulator thermometer control beaker temperature</p> <p><u>Lesson 5 - Evaluate our insulating heat experiment</u> Work scientifically to analyse data, make conclusions and evaluate the insulation experiment. Use the evaluation sentence stems to structure their written analysis and evaluation. <i>Next Steps: You will look at materials again when you learn about reversible and irreversible changes.</i></p> <p>Working scientifically Using test results to make predictions to set up further comparative and fair tests.</p> <p>Key Question What do the results tell you about which material is the best insulating material?</p> <p>Vocabulary thermal insulator data temperature conclusion anomalous result</p>	<p>Vocabulary independent variable, dependent variable, controlled variables,</p> <p><u>Lesson 4 - Water resistance experiment</u> Introduce children to water resistance. Plan a comparative test to observe whether the shape of an object affects the time it takes to fall to the bottom of a measuring cylinder filled with water. Understand that the more streamlined an object is, the less water resistance is acting upon it. This means that more streamlined objects will move through water more easily and with less effort. Link this to real-life examples such as sharks and dolphins. Ensure use of terms “independent” and “dependent” variables correctly. Identify variables that they will control during the experiment.</p> <p>Working scientifically Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Key question What is water resistance?</p> <p>Vocabulary air resistance, streamline, repeatability, precision,</p> <p><u>Lesson 5 - Gravity</u> Gravity is a non-contact force. It is difficult for children to understand because it cannot be seen. All objects have gravity, but gravity is only seen with large objects. The larger the mass of the object, the larger the gravity. This is why the Earth has greater gravity than the Moon. The force of gravity always acts towards the</p>	<p>of increasing complexity using scientific diagrams and labels</p> <p>Key Question Why does the brightness of the bulbs and loudness of the buzzers decrease when there are more components in the circuit?</p> <p>Vocabulary Series circuit Battery Bulb Current Voltage Buzzer</p> <p><u>Lesson 4 - Voltage Experiment</u> Plan and complete a fair test to explore how the voltage in a circuit affects the brightness of bulbs and the loudness of buzzers. Whilst planning, identify the equipment they will use and explain why each piece is necessary. To obtain valid results, a minimum of three batteries should be used to assess whether voltage affects the brightness of a bulb and the loudness of a buzzer. Draw associated circuit diagrams when constructing each circuit.</p> <p>Working scientifically Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Key question How does the voltage in a circuit affect the brightness of a bulb and the loudness of a buzzer?</p> <p>Vocabulary Independent variable Dependent variables Controlled variables</p> <p><u>Lesson 5 - Voltage experiment data</u> Evaluate their results and suggest experiment improvements. Determine that increasing voltage or the number of batteries increases the brightness of bulbs and the</p>	<p>to support or refute ideas or arguments.</p> <p>Key question What age is a human classed as an adult?</p> <p>Vocabulary Adult elderly person reproduce life expectancy</p> <p><u>Lesson 5 - Compare the gestation periods of different mammals.</u> Compare the gestation periods of different mammals. such as humans, elephants, domestic cats, domestic dogs, blue whales and wild rabbits. Identify any patterns seen in the data, such as “the larger the mammal, the longer the gestation period”.</p> <p>Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.</p> <p>Key question Which mammal has the longest/shortest gestation period?</p> <p>Vocabulary Womb fetus gestation mammal offspring</p> <p><u>Lesson 6 - Gestation Period & Lifespans</u> Analyse data to explore whether there is a relationship between the gestation periods of animals and their lifespans. Look at a range of different animals including African elephants, blue whales, domestic cats, domestic dogs, wild rabbits, horses and sheep. <i>Next Steps: More life cycles next. What similarities and differences do you think there will be?</i></p> <p>Working scientifically</p>	<p>describe the four stages of the life cycle of an insect – egg, larva, pupa and adult</p> <p>Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Key question What is incomplete metamorphosis, and can you give an example?</p> <p>Vocabulary Metamorphosis larva pupa chrysalis insect</p> <p><u>Lesson 4 - Life Cycle of a bird</u> Describe the life cycle of a bird, including the five different stages – egg, hatchling, nestling, fledgling and adult. Children should look at different examples of birds that can fly, such as owls, and birds that cannot fly, such as penguins. <i>Next Steps: Reproduction continues in your next topic but in plants not animals.</i></p> <p>Working scientifically 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.</p> <p>Key question What is an egg/hatchling/ nestling/ fledgling?</p> <p>Vocabulary Bird’s egg hatchling nestling fledgling adult bird</p>	<p>themselves and that they rely mainly on pollinators or wind to transfer the pollen to other plants. Once the pollen grain has attached to the stigma, it travels down the style into the ovary and joins with an ovule – this is fertilisation. The fertilised ovule will then turn into a seed, which can then be dispersed to grow into a new plant.</p> <p>Working scientifically 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.</p> <p>Key question What is pollination?</p> <p>Vocabulary Pollination pollen ovule fertilisation</p> <p><u>Lesson 4 - Asexual reproduction</u> Learn that asexual reproduction can occur with only one parent and results in offspring that are identical to the parent. These offspring are sometimes called “clones”. Certain plants, such as daffodils and onions, can reproduce asexually by producing bulbs. Other plants, such as potatoes, create tubers. Bulbs and tubers stay beneath the soil and</p>
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		<p>centre of the Earth. This is why objects always move towards the Earth when dropped. Complete simple tests to explore whether heavier objects fall faster than lighter objects. Create their own investigation plan more independently, using knowledge learnt from the previous steps.</p> <p>Working scientifically Identifying scientific evidence that has been used to support or refute ideas or arguments</p> <p>Key Question What is gravity?</p> <p>Vocabulary surface area, anomalous result, repeatability, gravity,</p> <p><u>Lesson 6 - Small forces for greater effect.</u> Look at different mechanisms including levers, pulleys and gears. Learn that these mechanisms are designed to make some jobs easier, by changing a smaller force into a larger force. Observe everyday uses of levers, pulleys and gears including bicycle gears and opening tins of paint. Understand that smaller gears with fewer teeth will cause a faster rotation. Next Step: You won't look in detail at forces again until KS3, where you will be able to apply your knowledge.</p> <p>Working scientifically Recognise which secondary sources will be most useful to research their ideas.</p> <p>Key Question How do levers, pulleys and gears work to allow a smaller force to have a greater effect?</p> <p>Vocabulary weight, contact force, non contact force, lever, gear,</p>	<p>loudness of buzzers. Suggest about how they can extend their investigation. <i>Next Step: You will explore electricity further as you move onto KS3.</i></p> <p>Working scientifically Using test results to make predictions to set up further comparative and fair tests.</p> <p>Key Question Did your results match your prediction? Why/why not?</p> <p>Vocabulary Voltage Current Repeatability</p>	<p>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.</p> <p>Key question Is there a relationship between the gestation period of an animal and its lifespan?</p> <p>Vocabulary Gestation lifespan correlation anomaly</p>		<p>eventually develop into a new plant in the soil. Strawberries produce new plants at the ends of runners. An example of asexual reproduction in animals is starfish.</p> <p>Working scientifically Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Key question What is asexual reproduction?</p> <p>Vocabulary Clone runner tuber bulb asexual reproduction</p> <p><u>Lesson 5 - Cloning Plants</u> As a class, take cuttings from parent plants. Ensure they use equipment safely when taking their cuttings. They measure the initial length of their cuttings with a ruler. They should then plant the cuttings in some compost, using rooting powder or gel to encourage growth of the plants. The plants should be kept away from direct sunlight and should be covered with a clear plastic bag to keep them moist. Children should make observations and measure their cuttings over the next six weeks. They will measure the final length of their plants and present their findings from the investigation Next Step: In year 6, you will</p>
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		pulley, machine				<p>look at classifying different types of plants.</p> <p>Working scientifically Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Key question What is a successful way to clone a plant?</p> <p>Vocabulary Clone cutting parent plant compost asexual reproduction</p>
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Cycle B 24/25; 26/27

Year group(s)	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Early Years						
Year 1 & 2	<p>Living Things and their Habitats (Y1)</p> <p><i>Recap: What do humans need to survive?</i></p> <p>Lesson 1 - Humans Children to match offspring to adult to include Puppy/Dog Calf/cow egg/chicken spawn/frog lamb/sheep kitten/cat Ensure children use the term offspring. Identify simple changes that occur within each life stage. <i>Changes related to puberty do not need to be discussed, because these will be taught in UKS2.</i></p> <p>Working scientifically Identifying and classifying. Asking simple questions and</p>	<p>Everyday Materials (Y1)</p> <p><i>Recap: What materials are objects made from?</i></p> <p>Learning 1: Explore materials - wood, plastic, glass & metal Focus on wood, plastic, glass and metal objects and sort them into different categories such as hard and soft. Sort the same collection of materials in different ways and could be encouraged to come up with their own criteria when sorting objects into groups. Find simple similarities and differences between materials. Support with using correct scientific vocabulary to describe</p>	<p>Plants - Bulbs and Seeds (Y2)</p> <p><i>Recap: What do plants need to grow?</i></p> <p>Lesson 1 - Use simple equipment such as hand lenses to make accurate observations. Children should look at common bulbs and observe shoots and roots, such as those from daffodils, onions and garlic. Children should look at seeds both inside and outside fruits, such as seeds in sweet peppers, seeds in strawberries and sunflower seeds. Encourage children to sort and group the bulbs and seeds in different ways.</p>	<p>Plants - Light and Dark (Y2)</p> <p><i>Recap: Name a variety of common wild and garden plants, including deciduous and evergreen trees.</i></p> <p>Lesson 1 - What do plants need to grow? The national curriculum states that children should identify that plants need water, light and to be kept at the correct temperature in order to grow and stay healthy. Have a variety of seeds available for the lesson. Observe the seeds in detail and make accurate observations using hand lenses. Look at and label parts of a seed. Within this</p>	<p>Animals including Humans - Survival (Y2)</p> <p><i>Recap: In cycle A you learned what features all mammals have. Can you name the features of a mammal?</i></p> <p>Lesson 1 - What mammals need to survive Children should know that all mammals need air, water, food and shelter to survive. Children should use the term “air” instead of oxygen, as they have not yet been introduced to gases. They will need to recap the terms “carnivore”, “omnivore” and “herbivore” so they can differentiate between different dietary</p>	<p>Animals including Humans (Y2)</p> <p><i>Recap: What is a mammal?</i></p> <p>Lesson 1 - Why exercise is good for you Carry out a simple investigation to see whether different forms of exercise increase their heart rate. Children do not need to find their pulse (heart rate) and count beats per minute. They can observe whether their heart rate has increased by putting three fingers on either the left or right side of their neck underneath their jaw. Before completing the investigation, make predictions to state which</p>

	<p>recognising that they can be answered in different ways. Key question What are the 5 stages of a human life cycle? Vocabulary Offspring, baby, toddler, child, teenager, adult.</p> <p>Lesson 2 - Other mammals Explore simple life cycles of a range of mammals. Children should compare the life cycle of humans with other mammals, noticing patterns, similarities and differences. Describe familiar mammals' life cycles. They should identify that baby mammals need milk from their mother before they learn to eat solid food, move and play. As adolescents, mammals gain independence. Most mammals become.</p> <p>Working scientifically Asking simple questions and recognising that they can be answered in different ways. Key question How are the life cycles of mammals the same or different? Vocabulary Mammal life cycle baby adolescent adult</p> <p>Lesson 3 - Frog Identify the life stages of a frog as frogspawn (eggs), tadpole, young frog (froglet) and adult frog. If possible, create an area to attract frogs, so that children can observe the life cycle directly. Make simple comparisons between the life cycle of amphibians and the life cycle of mammals. Working scientifically Identifying and classifying. Key question</p>	<p>different materials. Build a word bank that children can use throughout the block to address this. Glass objects such as beads or marbles should be used. Working scientifically Identifying and classifying. Key question How can we sort materials? Vocabulary Material hard soft shiny dull</p> <p>Lesson 2 - Explore materials – rock Build on previous lesson's knowledge to explore rocks. Take part in practical activities such as a rock hunt. Learn how to use hand lenses to closely observe the rocks. <i>Children do not need to name different types of rock during this step as this vocabulary is not introduced until LKS2</i> Working scientifically Observing closely, using simple equipment. Key question How can we sort rocks? Vocabulary Rock heavy light rough smooth</p> <p>Lesson 3 - Objects & Materials Name common objects and identify the materials they are made from. Explore objects that are made from wood, plastic, glass, metal, rock and fabric. Sort a range of objects made from the same material and the same object made from different materials, e.g. a wooden spoon and a metal spoon. <i>Children only need to name the materials they identify and not define them.</i> Working scientifically Identifying and classifying.</p>	<p>Working scientifically Observing closely, using simple equipment. Key question Is this a bulb or a seed? Vocabulary Plant bulb seed shoot roots</p> <p>Lesson 2 - To investigate the effects of temperature on bulbs and seeds Plant bulbs and seeds under different temperature conditions, such as in pots outside and inside, or in pots in cooler and hotter areas of the school. Light and dark conditions were observed in the previous Plants block. Here, the effect of changing the temperature the plant is kept at can be observed. Children will make predictions and should create a schedule for recording plant growth over time. Working scientifically Asking simple questions and recognising that they can be answered in different ways. Key question How do bulbs and seeds change over time? Vocabulary Seed plant sunlight temperature growth</p>	<p>step, children should understand that some plants grow from seeds and that seeds need water and the correct conditions to grow. Children do not need to understand the germination process in this step, as this is covered in LKS2. Working scientifically Asking simple questions and recognising that they can be answered in different ways. Key question Why do we need to water plants? Vocabulary Seed plant sunlight</p> <p>Lesson 2 - Light and Dark Experiment Plan a comparative test to explore whether plants grow healthier in light or darkness. Ask children to make predictions as to what will happen to each seed. The effects of this experiment can be observed throughout the half term periodically and children can record their observations over time. Plant seeds and provide one plant pot with access to sunlight, while the other should be kept in the dark. Make regular observations of the plants' growth throughout the term to make comparisons. To maintain consistency, both plants should be kept indoors at the same temperature. At this stage, children do not need to specifically measure or control the temperature at this stage. Working scientifically Performing simple tests, make observations, record</p>	<p>requirements. Working scientifically Asking simple questions and recognising that they can be answered in different ways. Key question What 4 things do mammals need to survive? Vocabulary Mammal Fur Carnivore Herbivore Omnivore</p> <p>Lesson 2 - What birds need to survive Children look at birds and explore their needs for survival. Children should understand that birds have the same needs as mammals. It is important that they are shown a wide range of examples, including flightless and swimming birds. Children will be introduced to the term "insectivore" within this step. Working scientifically Gathering and recording data to help in answering questions. Key question How are the needs of birds similar to the needs of mammals? Vocabulary Bird Feathers Beak Insect Insectivore</p> <p>Lesson 3 - What fish need to survive They will recap the basic features of fish before understanding that fish need air, water, food and shelter to survive. By the end of this step, children should identify that fish have the same needs for survival as birds and mammals. Working scientifically Identifying and classifying. Key question What do fish need to survive?</p>	<p>form of exercise will raise their heart rate the most and why. Understand that exercise improves physical health, mental health. Exercising daily makes your heart stronger. Working scientifically Gathering and recording data to help in answering questions.</p>
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	<p>What are the 4 stages of a frog's life cycle?</p> <p>Vocabulary Amphibian frogspawn tadpole froglet frog</p> <p>Lesson 4 - Butterfly Learn that the life cycle of a butterfly is egg, caterpillar, pupa and butterfly. Give children the opportunity to observe the life cycle of a butterfly directly with a reusable butterfly kit if possible.</p> <p>Working scientifically Observing closely, using simple equipment.</p> <p>Key question What are the 4 stages of a butterfly's life cycle?</p> <p>Vocabulary Egg caterpillar pupa (chrysalis) butterfly</p> <p>Lesson 5 - Are there patterns between the life cycles of different animals? Look at the life cycles of all the different animal groups explored throughout the unit. Spot patterns, as well as similarities and differences, based upon the observations that they have made. Recognise that offspring are born in different ways, such as live young for most mammals and eggs for other animal groups. They may also notice that each life cycle lasts for a different length of time. <i>Next Steps: In UKS2, you will be exploring the life cycles of different animals.</i></p> <p>Working scientifically Using their observations and ideas to suggest answers to questions.</p> <p>Key question</p>	<p>Key question What material is the object made from?</p> <p>Vocabulary Object material wool wood glass metal plastic rock</p> <p>Lesson 4 - Melt & Freeze Provide opportunity to work practically throughout this to observe how some materials melt and freeze. Consider freezing some toys or objects into ice cubes. Identify that water needs to be frozen to turn to ice and ice needs to be heated up to melt. Children do not need to be introduced to the term "degrees Celsius" to describe temperature changes, as this is introduced in cycle A. Experience melting and freezing through hands-on learning. Wherever possible, link these processes to real life examples such as ice cream and snow melting and creating ice cubes in the freezer.</p> <p>Working scientifically Performing simple tests.</p> <p>Key question How could we remove a toy from the ice block?</p> <p>Vocabulary Solid liquid melt freeze ice</p> <p>Lesson 5 - Float or sink? Make simple statements to predict which objects will float or sink. Carry out a short investigation to see whether their predictions are correct. Test a wide range of objects made from different materials. Identify both the object and the material it is made from. Throughout the investigation, record data in a simple table using ticks to indicate whether the objects</p>		<p>results</p> <p>Key question At the start - What things should we keep the same for both plants? At the end - Do plants grow healthier in the light or dark? (You may notice that the plant grown in the dark is a white/pale colour)</p> <p>Vocabulary Seed plant sunlight compost soil Independent variable Dependent variable Controlled variable</p>	<p>Vocabulary Fish scales gill fin</p> <p>Lesson 4 - Identify amphibians Children should name and identify common examples of amphibians before looking at their needs for survival. Children may think that amphibians are fish as they spend part of their life in water. It is important to explore the differences between these two animal groups. Children should identify amphibians' needs for survival and compare these to other animal groups.</p> <p>Working scientifically Identifying and classifying.</p> <p>Key question Where do amphibians live and what do they need to survive?</p> <p>Vocabulary Amphibian Webbed feet Frog Toad Newt</p> <p>Lesson 5 - What do reptiles need to survive Children should understand that reptiles need air, water, food and shelter to survive. Reptiles also need external heat to survive as they cannot generate their own body heat. This could be used as a key difference when sorting animals based on their needs for survival.</p> <p>Working scientifically Gather and record data to help in answering questions.</p> <p>Key question What features do reptiles have and what do they need to survive?</p> <p>Vocabulary Reptile scales carnivore herbivore</p>	
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	<p>Are there patterns between the life cycles of different animals?</p> <p>Vocabulary Life cycle egg amphibian insect mammal compare</p>	<p>float or sink.</p> <p>Working scientifically Gathering and recording data to help in answering questions.</p> <p>Key question Can you sort these objects into those you think will float and sink? Was your sorting correct?</p> <p>Vocabulary Material float sink heavy light</p> <p><u>Lesson 6 - Does it absorb water?</u> Carry out a simple investigation to explore which materials are able to absorb water. Before the test, it is essential that children have a clear understanding of the term “absorb”. Use observations to identify which material has absorbed the most water and the least water.</p> <p>Working scientifically Using their observations and ideas to suggest answers to questions.</p> <p>Key questions Do all materials absorb water?</p> <p>Vocabulary absorb</p> <p><u>Lesson 7 - Investigate materials</u> Carry out a comparative test to explore the best material for curtains. Identify that curtains need to be easily opened and closed without losing their shape and should only let a small amount of light pass through. Perform simple tests on a range of materials before identifying the most suitable material. In this investigation, children are introduced to the terms “transparent” and</p>				
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		<p>“opaque”. The term “translucent” should not be used in this step as it is introduced in cycle A. <i>Next Steps: In Cycle A you’ll look at different materials and test them by bending, squashing, twisting and stretching them</i></p> <p>Working scientifically Using their observations and ideas to suggest answers to questions.</p> <p>Key question What do “transparent” and “opaque” mean?</p> <p>Vocabulary Transparent opaque</p>				
Year 3 & 4	<p>Rocks, Fossils and Soil - (Y3)</p> <p><i>Recap: In Years 1 and 2, you looked at rocks as a type of material. What are the properties of rocks?</i></p> <p><u>Lesson 1 - Identify rocks</u> Identify granite, pumice, sandstone, chalk, marble and gneiss. Use simple equipment, such as hand lenses, to observe these rocks closely and note any similarities or differences between them. These rocks are examples of metamorphic, sedimentary and igneous rock. Children do not need to use these terms to describe rocks, nor do they need to understand how these rocks are formed.</p> <p>Working Scientifically Making systematic and careful observations.</p> <p>Key Question What is a rock?</p> <p>Vocabulary granite, pumice, sandstone, chalk, marble, gneiss,</p> <p><u>Lesson 2 - Grouping and classifying rocks</u> Sort and group rocks in</p>	<p>Sound - (Y4)</p> <p><i>Recap: In Reception you listened to sounds. What happened when the sound source got further away?</i></p> <p><u>Lesson 1 - Vibrations</u> Learn that sounds are made when objects vibrate. Understand that we hear sounds because an object vibrates. These vibrations then travel through the air (or another medium) to our ears.</p> <p>Working scientifically Asking relevant questions and using different types of scientific enquiries to answer them</p> <p>Key Question How do we hear sounds?</p> <p>Vocabulary Vibration ear sound pitch volume</p> <p><u>Lesson 2 - The Ear</u> Learn how sound reaches the ear and how the different parts of the ear allow us to hear sounds. Understand what the main parts of the inner ear are and the roles that they play in how sounds are heard.</p>	<p>Animals: Nutrition, Diet & skeletons (Y3)</p> <p><i>Recap: In Year 2 you learned the different stages of the human life cycle. Can you name the stages?</i></p> <p><u>Lesson 1 - Explore the human skeleton</u> Explore the human skeleton by naming and identifying bones: skull, femur, pelvis, spine and ribcage. Identify and locate these bones in the human body.</p> <p>Working Scientifically Asking relevant questions and using different types of scientific enquiries to answer them</p> <p>Key Question What are the names of some of the bones in the human body and which part of the body would you find them?</p> <p>Vocabulary Skeleton, skull, ribcage, spine, pelvis, femur,</p> <p><u>Lesson 2 - Human Skeleton</u> Describe the importance of humans having a skeleton with reference to</p>	<p>Animals: Nutrition, Diet & skeletons (Y3)</p> <p><u>Lesson 5 - Learn how the skeleton, joints and muscles work together to allow movement.</u> Learn that muscles pull on bones to create movement. Understand that muscles cannot push, which is why they work in pairs. Use the terms “contract” and “relax” to describe this process. Children do not need to name and label major muscle groups in the human body. Only identify and label the biceps and triceps in the upper arm.</p> <p>Working Scientifically Communicate their findings in ways that are appropriate for different audiences</p> <p>Key Question How do muscles work in pairs to allow movement?</p> <p>Vocabulary Muscle, Muscle Joint, Bicep and tricep, Contracting Relaxing</p> <p><u>Lesson 6 - Food groups</u> Learn that food can be</p>	<p>Light (Y3)</p> <p><i>Recap: You observed shadows in Nursery. What do you need to make a shadow?</i></p> <p><u>Lesson 1 - Sources of light.</u> This is the first time that children have explored light and therefore they may have some common misconceptions about light and how it is produced. In this step, explore the difference between natural and artificial sources of light. They should be given opportunities to sort and group different light sources based on these two categories.</p> <p>Working scientifically Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Key Question What is a light source?</p> <p>Vocabulary Light, eyes, light sources, natural light sources, artificial light sources</p> <p><u>Lesson 2 - Sun Safety</u> Learn about some of the</p>	<p>Plants (Yr3)</p> <p><i>Recap: In year 2 you learnt about what plants need to survive. Why do plants need water?</i></p> <p><u>Lesson 1 - Parts of a plant</u> Parts of a plant and their functions including water transportation Recap the parts of a flowering plant, then look at their functions and why they are important to the plant. Set up an observation of a flower (white spray carnations or gypsophila work well. Celery stems which have leaves are also useful to see the vessels carrying the coloured water) Explore the stem and water transportation. Learn how water is absorbed by the roots from the soil and how it travels up the stem into the leaves and flowers.</p> <p>Working Scientifically Using straightforward scientific evidence to answer questions or to support their findings. Setting up simple practical enquiries, comparative and fair tests.</p>

	<p>different ways based on their simple physical appearance. Understand that some rocks have crystals, grains or layers and this information can be used to sort rocks into different groups. Choose their own categories to sort rocks into and should understand that rocks can be grouped in more than one way. Children do not need to sort the rocks into metamorphic, sedimentary and igneous rock.</p> <p>Working Scientifically Talk about criteria for grouping, sorting and classifying</p> <p>Key Question How can you group these rocks?</p> <p>Vocabulary crystals, grains, layers, texture, weathering,</p> <p><u>Lesson 3 - Test rocks</u> Perform simple tests on rocks to learn more about their different properties. Test granite, pumice, sandstone, chalk, marble and gneiss to further their understanding of different rock types. Introduce the idea of “a reaction” using vinegar dropped onto the rocks. Understand that vinegar is acidic and it can cause a reaction on some rocks and not others.. Use an iron nail to test for hardness.</p> <p>Working Scientifically Talk about criteria for grouping, sorting and classifying <i>Health & Safety - Ensure they are aware that the nail can cause damage to themselves or others if used incorrectly.</i></p> <p>Key Question What tests can you carry out on rocks to learn more</p>	<p>Working scientifically Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p> <p>Key Question How do the different parts of the ear help us hear?</p> <p>Vocabulary Outer ear cochlea ear bones ear drum ear canal</p> <p><u>Lesson 3 - Investigate sound</u> Explore sound and understand how the intensity of sound is measured. Learn that the intensity, or loudness, of sound is measured in decibels (dB).</p> <p>Working scientifically Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Key Question How is sound measured and does the loudness of sound in the classroom change over the day?</p> <p>Vocabulary Sound volume decibel decibel meter vibration</p> <p><u>Lesson 4 - Explore Pitch</u> Explore how the strength of the vibrations affects the volume of a sound. Understand that, in general, louder sounds have bigger vibrations and quieter sounds have smaller vibrations. Explore the concept of volume using musical instruments.</p> <p>Working scientifically Setting up simple practical enquiries, comparative and</p>	<p>movement, support and protection. Describe functions (or jobs) of the spine, ribcage, pelvis, skull and femur. It is important that children are not only aware of the function of the skeleton but also the jobs of specific bones.</p> <p>Working Scientifically Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Key Question What are the 3 functions of a skeleton and specifically the skull, pelvis, spine and ribcage?</p> <p>Vocabulary Skeleton, skull, ribcage, spine, pelvis, femur,</p> <p><u>Lesson 3 - Animal Skeleton</u> Apply knowledge of bones in the human skeleton to identify, locate and name bones in a variety of animals. It is important that children are shown a wide range of animal skeletons including mammals, birds, fish, amphibians and reptiles. Identify similarities or differences between them. Children do not need to use the term “vertebrate” as this is introduced in Cycle A. Sort and group animals as their understanding of the inquiry question develops.</p> <p>Working Scientifically Talk about criteria for grouping, sorting and classifying (non statutory).</p> <p>Key Question How can you sort and group animals based on their skeletons?</p> <p>Vocabulary Mammal, bird, fish, amphibian, reptile,</p>	<p>sorted into five food groups – fruit and vegetables, carbohydrates, protein, dairy (and alternatives) and fats and sugars. Group and sort food correctly into each group. Learn about the functions of different food groups. This includes the effects of fruit and vegetables, carbohydrates, proteins, dairy and alternatives and fat and sugar on the body</p> <p>Working Scientifically Talk about criteria for grouping, sorting and classifying</p> <p>Key Question What are the names of the five food groups and what do they do for the body?</p> <p>Vocabulary carbohydrate protein dairy product fat sugar</p> <p><u>Lesson 7 - Balanced Diet</u> Explore what a balanced diet is and its importance in maintaining good health. Explain that a variety of different foods are needed for a balanced diet. Understand the importance of eating the right amount of food. Understand that vegan and vegetarian diets are similar, but vegans do not eat any animal products. Explore a pescatarian diet, which involves eating fish but no other meat products.</p> <p>Working Scientifically Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Key Question What is a balanced diet and why is it important?</p> <p>Vocabulary balanced diet balanced meal nutrition</p>	<p>harmful effects of the Sun and explore ways to protect their eyes from the Sun’s rays. It is important that children are aware of how to keep safe in the Sun and they should understand that they should never look directly into the Sun. They should also explore the different ways that they can keep their eyes safe during daylight hours. Children may have limited understanding about the Sun, therefore a discussion about its necessity for survival is essential within this step. Children should be aware that the Sun provides both heat and light to allow humans and other life to survive.</p> <p>Working scientifically Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p> <p>Key Question Why should we protect our eyes from the sun?</p> <p>Vocabulary Sun, natural light source, eyes, sunglasses, protect</p> <p><u>Lesson 3 - The Eye</u> Children learn about the eye and how we see. Children should understand that light travels in straight lines. This can be modelled in the classroom using a torch beam on a surface. In Year 3, children only need to be able to simply explain how we are able to see objects. They should identify that we are able to see an object because light reflects off it, enters our eyes, and the brain processes this information. All everyday objects reflect light to some extent, but smooth, shiny</p>	<p>Key Question What is the function of the flowers/leaves/roots/stem?</p> <p>Vocabulary Leaf stem roots flower water transportation</p> <p><u>Lesson 2 - Germination</u> Learn about the process of “germination”.</p> <p>Working Scientifically Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Key Question What is germination?</p> <p>Vocabulary Seed seedling seed coating germination</p> <p><u>Lesson 3 - Plant requirements for growth</u> Plan an experiment to test the best condition for plant growth. Factors that need to be included: air, light, water, nutrients (from soil) and room to grow. Children should work in small groups to make a prediction and create a logical experiment plan. Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Working Scientifically Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests.</p> <p>Key Question What are the best conditions for a plant to grow successfully?</p> <p>Vocabulary Plant seeds soil water observation</p> <p><u>Lesson 4 - Learn about the reproductive parts in flowering plants.</u></p>
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	<p>about their different properties? Vocabulary Reaction, hardness, float, sink, brittle</p> <p>Lesson 4 - Explore Fossils Understand that fossils are usually formed from the shells or bones of living things, but can also be formed from animal tracks and footprints. Observe replicas of fossils, as well as pictures, to allow them to group fossils and describe their features. Working Scientifically Asking relevant questions and using different types of scientific enquiries to answer them. Key Question What is a fossil? Vocabulary fossil rock skeleton shell</p> <p>Lesson 5 - Fossil formation Understand that fossilisation is a rare process and will only happen under certain conditions. Understand that after an animal dies, the soft parts of the animal's body break down, leaving behind the hard parts, such as the skeleton and teeth. The hard parts become buried by sediment. Sediment contains soil, sand, gravel and small pieces of rock. Over time, many layers of sediment build up on top of the skeleton, which leads to a lot of pressure. Working Scientifically Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Key Question What are the key stages of fossilisation?</p>	<p>fair tests. Key Question Do bigger or smaller vibrations produce louder sounds? Vocabulary Pitch high pitch low pitch sound</p> <p>Lesson 5 - Explore Volume Explore the term “pitch”. Understand that pitch refers to how high or low a sound is. Look at a range of instruments and objects to explore how the pitch of the sound made by different objects can be changed. Working scientifically Identifying differences, similarities or changes related to simple scientific ideas and processes. Key Question What happens to the pitch of the string when it is tightened and loosened? Vocabulary Pitch high pitch low pitch sound</p> <p>Lesson 6 - Volume Experiment Plan a fair test to explore whether distance has an effect on the volume of a sound. Use data loggers to measure decibels. <i>Next Steps: You don't cover sound again until KS3 but you will be able to apply your knowledge of fair testing again.</i> Working scientifically Setting up simple practical enquiries, comparative and fair tests. Key Question How does the distance from the sound source affect the volume of the sound? Vocabulary volume decibel (dB) decibel meter ear background noise</p>	<p>antennae, insect, skeleton exoskeleton</p> <p>Lesson 4 - Identifying joints Identify two different joint types – hinge and ball and socket joints. Name and identify the hips, elbows, knees and shoulder joints. Describe whether these are examples of hinge or ball and socket joints. Understand that major bones in the human body are connected by joints, for example the hip joints connect the pelvis and femurs. Working Scientifically Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations Key Question Why do we have joints and do all joints allow the same movement? Vocabulary Joints, Hinge joint Ball and socket joint Skeleton,</p>	<p>Lesson 8 - Name and identify a range of animals and state whether they are carnivores, herbivores or omnivores. This includes animals that are kept as pets and animals that live in the wild. They also look at how animals' teeth can be used as an indicator of diet. Next steps: You will learn more about the human body in Cycle A, you will discover how food travels through the body Working Scientifically Identifying differences, similarities or changes related to simple scientific ideas and processes. Key Question What are the different types of animal diets and why don't all animals eat the same food? Vocabulary vegan diet vegetarian diet pescatarian diet omnivorous diet</p>	<p>surfaces (such as mirrors or polished metals) are better at reflecting light than others. In this step, children do not need to learn the names of the parts of the eye, as this is covered in UKS2. Working scientifically Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Key Question Why do we see things? (Because light reflects off something into our eyes.) Vocabulary Reflection, light sources, shiny, dull</p> <p>Lesson 4 - How shadows are formed Learn that a shadow is formed when light is blocked by an opaque object. In Key Stage 1, children used the terms “opaque”, “transparent” and “translucent” to describe different materials. They will examine what the terms mean in more depth in the next two lessons. Working scientifically Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Key Question What is a shadow and how is it formed? Vocabulary Opaque, translucent, transparent, shadow</p> <p>Lesson 5 - Opaque, translucent, transparent. Children build on their understanding of the terms opaque, translucent, transparent. Carry out a short investigation to explore these concepts</p>	<p>Learn that the “stamen” is the male reproductive parts, and the “pistil” is the female reproductive parts. However, children do not need to be aware of the individual structures that make up the stamen and pistil as these will be covered in UKS2. Working Scientifically Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Key Question Where are the reproductive parts of a flowering plant? Vocabulary Flower petals stamen pistil reproductive organs</p> <p>Lesson 5 - Pollination & seed formation Learn that pollination involves the transfer of pollen grains from the male parts of a flower (stamen) to the female parts (pistil) of a flower. Children also learn that seeds are formed when pollen grains and eggs join. Working Scientifically Use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences Key Question What is pollination? Vocabulary Pollination pollen stamen pistil pollinators</p> <p>Lesson 6 - Seed dispersal Learn what seed dispersal is and describe the different ways that it occurs. Seed dispersal can be through wind, animals, water or an “explosion” within the seed</p>
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	<p>Vocabulary fossilisation rock skeleton fossil sediment</p> <p>Lesson 6 - Explore soil Explore different types of soil such as sandy, clay, peat and chalky soils which are types of soil. Working Scientifically Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables Key Question What is soil and what are the different types of soil? Vocabulary Soil Sandy soil Chalky soil Clay soil Peat Organic matter</p> <p>Lesson 7 - The importance of soil Learn about the importance of soil. This includes why many living things need soil to survive. It is important that children are aware of the importance of soil to both animals and plants. This includes providing nutrients and water for plants and habitats for many animals. Working Scientifically Using straightforward scientific evidence to answer questions or to support their findings. Key Question Why is soil important to plants and animals? Vocabulary Soil nutrients habitat loss deforestation</p> <p>Lesson 8 - Soil experiment Plan and carry out a comparative test to explore the absorbency of different soils. Children test four different soils to see if they retain the same volume of water. <i>Next Steps: You will</i></p>	Independent dependent controllable variable			<p>further. Children initially identify whether objects are opaque, translucent or transparent before observing whether light is able to pass through these objects or not. Then they pick which objects cast the clearest and most defined shadows. They should identify that translucent objects do not form clear and defined shadows when a light source is shone at them, as light can pass through, and that opaque materials form clear and defined shadows as light does not pass through them. Working scientifically Asking relevant questions and using different types of scientific enquiries to answer them. Key Questions What do “opaque”, “translucent” and “transparent” mean? Vocabulary Opaque, translucent, transparent, shadow</p> <p>Lesson 6 - Investigation(Longer session) Investigate how the distance between an object and a light source affects the size of the shadow it forms. Children should be encouraged to set up practical equipment and make systematic and careful observations throughout. Next Steps: In Yr6 you will learn about how the eye allows us to see. Working scientifically Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Key Question How does the distance</p>	<p>pod to disperse the seeds. Children should be given the opportunity to observe different types of seed and should be encouraged to link the seeds’ features to seed dispersal. Working Scientifically Identifying differences, similarities or changes related to simple scientific ideas and processes. Key Question What are the ways in which seed dispersal can occur? Vocabulary Wind dispersal animal dispersal water dispersal explosion dispersal seed dispersal</p> <p>Lesson 7 - Life cycle of plants Use their knowledge of seeds, germination, reproductive parts, pollination and seed dispersal to learn about the life cycle of plants. <i>Next Step: In UKS2, you will learn about the life cycle of different plants.</i> Working Scientifically Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Key Question What are the stages in a plant’s life cycle? Vocabulary Seed germination pollination seed dispersal life cycle</p>
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	<p><i>learn more about fossils in Year 6 when you look at evolution.</i></p> <p>Working Scientifically Setting up simple practical enquiries, comparative and fair tests.</p> <p>Key Question Which soil absorbs the most water?</p> <p>Vocabulary Independent dependent controllable variable</p>				<p>between the light source and the object affect the size of a shadow?</p> <p>Vocabulary light sources opaque shadow distance</p>	
Year 5 & 6	<p>Animals including Humans The Circulatory System (Yr6)</p> <p><u>Lesson 1 - The circulatory system</u> <i>Recap: In LKS2, you learnt about the digestive system, and the skeletal and muscular system. What are the differences between these systems?</i></p> <p>Identify that the circulatory system is made up of the heart, blood vessels and blood, and that these work together to circulate blood around the body. Identify that there are three main types of blood vessel (arteries, veins and capillaries). Arteries take blood away from the heart, veins carry blood towards the heart and capillaries link arteries and veins together.</p> <p>Working scientifically Explore ideas and raise different kinds of questions.</p> <p>Key questions What are the 3 main parts of the circulatory system and what is their function?</p> <p>Vocabulary Circulatory system Heart blood vessels veins arteries capillaries</p> <p><u>Lesson 2 - Blood</u> Identify that blood is made up of plasma, red blood cells</p>	<p>Light (Y6)</p> <p><u>Lesson 1 - The Eye</u> <i>Recap: In LKS2 you learned about light and shadows. How are shadows formed?</i></p> <p>Name and identify simple parts of the human eye and discuss their functions in relation to being able to see objects. Explore the idea that some objects emit light while others reflect light.</p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.</p> <p>Key question What is the function of the pupil/ retina/ lens/ iris?</p> <p>Vocabulary Light source retina lens pupil iris</p> <p><u>Lesson 2 - Light & Straight lines</u> Identify that light travels in straight lines, but that it can change direction if it is reflected from an object. Draw simple ray diagrams to explain how light travels in straight lines from a light source to an object and is then reflected to the eye.</p> <p>Working scientifically Recording data and results of increasing complexity</p>	<p>Earth and Space (Y5)</p> <p><i>Recap: This is the first time you have learned about space in science. Can you name any of the planets?</i></p> <p><u>Lesson 1 - Understand that the solar system is made up of the Sun, celestial bodies, eight planets and their moons.</u> Research how our ideas about the Solar System have changed over time by exploring the views of different scientists and mathematicians. Compare these views to current ideas about the Solar System.</p> <p>Working scientifically Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Key question What are the different parts that make up the Solar System?</p> <p>Vocabulary Solar system, stars, planets, sun</p> <p><u>Lesson 2 - Learn about the eight planets in the Solar System and their features.</u> Understand that all the planets in our Solar System orbit the Sun. Look at the different surfaces of the planets. Recognise that the</p>	<p>Reversible and Irreversible Change (Y5)</p> <p><i>Recap: In LKS2, you learnt the difference between a solid, a liquid and a gas. What process enabled a liquid to become a solid?</i></p> <p><u>Lesson 1 - Dissolving</u> Learn about the process of dissolving and explore the difference between soluble and insoluble substances. Know that a soluble substance can dissolve in a liquid to make a solution. Children should be aware that increasing the temperature of a liquid and stirring it will increase the rate at which soluble substances dissolve in it.</p> <p>Working scientifically Using test results to make predictions to set up further comparative and fair tests.</p> <p>Key question What does “soluble/insoluble” mean and can you name a substance for each?</p> <p>Vocabulary Soluble insoluble solution substance dissolve</p> <p><u>Lesson 2 - Filtering & Sieving</u> <i>Recap the difference between solids, liquids and</i></p>	<p>Evolution & Inheritance (Y6)</p> <p><i>Recap: In Cycle A, you learnt about reproduction and life cycles. How do some life cycles differ?</i></p> <p><u>Lesson 1 - Variation</u> The term variation is introduced for the first time in this unit. Explore the term “species” as a group of similar organisms where two parents can reproduce to create offspring. They also learn that “variation” refers to differences between organisms.</p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas</p> <p>Key question What is a species and can you give an example of variation within a species?</p> <p>Vocabulary Variation species offspring organism</p> <p><u>Lesson 2 - Inheritance & Characteristics</u> This topic is sensitive, and knowledge of your family situations is beneficial. Children looked at sexual reproduction in cycle A. Children should have opportunities to learn that</p>	<p>Diet, Drugs and Lifestyle (Y6)</p> <p><i>Recap: In LKS2, you learnt about nutrition. What are the 5 main food groups?</i></p> <p>Children may be sensitive when discussing diet and calories in Year 5/6 and it is important to be aware of this.</p> <p><u>Lesson 1 - Explore the impact of diet on overall heart health.</u> They learn that fats can be classified as saturated, unsaturated and trans fats. Children should learn that the body needs vitamins (such as, A, C and D) and minerals (such as iron and calcium). Ideally we should be basing our diets around as many whole foods that are close to nature as possible. As a food like fruit or corn becomes more processed, it gradually becomes less nutritious.</p> <p>https://assets.heartfoundation.org.nz/documents/teacher-tools/activity-sheets/processed-food-activity-teacher-guide.pdf?mtime=1667526711?171255 9203 has an activity demonstrating whole foods compared to ultra processed foods.</p>

	<p>and white blood cells. Understand that the main function of red blood cells is to carry oxygen from the lungs to the rest of the body. Know that plasma carries nutrients, water and other substances around the body and that white blood cells attack viruses and bacteria.</p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas</p> <p>Key question What is the function of each part of the blood?</p> <p>Vocabulary Red blood cells white blood cells lungs nutrients plasma oxygen</p> <p><u>Lesson 3 - The Heart</u> Learn that the heart is a muscle. Know that the heart is a pump and should understand that when the heart contracts, it pumps blood around the circulatory system, through the blood vessels. Identify that the heart is divided into two halves (right and left), each consisting of two chambers (atrium and ventricle).</p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas</p> <p>Key question What is the role of the heart in the circulatory system?</p> <p>Vocabulary Heart atria ventricles left/right atrium Left/right ventricle</p> <p><u>Lesson 4 - Blood flow in the Heart</u> Understand that blood flows in one direction around the body and through the heart. Be aware that there are</p>	<p>using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Key question How does light travel and why do we need light to see objects?</p> <p>Vocabulary Light source reflection ray diagram angle periscope</p> <p><u>Lesson 3 - Shadow formation</u> Use the fact that light travels in straight lines to look at how shadows are formed. Determine that because light travels in straight lines, the shadow will be the same shape as the object that cast the shadow. May need to revisit the terms opaque, translucent and transparent.</p> <p>Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Key question What causes a shadow to form?</p> <p>Vocabulary shadow opaque translucent transparent solar eclipse</p> <p><u>Lesson 4 - Plan a shadow experiment</u> Plan a fair test to explore whether the distance from a light source affects the size of the shadow. Plan their experiment and identify the independent, dependent and controlled variables. At this stage in Year 6, children should plan their experiment more independently.</p> <p>Working scientifically Planning different types of</p>	<p>first four planets have solid surfaces whilst the last four planets have gas surfaces.</p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas</p> <p>Key questions How are the first four planets in the solar system different from the last four?</p> <p>Vocabulary spherical, orbit, surface, appearance,</p> <p><u>Lesson 3 - Motion of the planets</u> Learn about the movement of the Earth and the other planets in the Solar System (including how long it takes for each planet to orbit the Sun and why) Explain the movement of the planets around the Sun with reference to key vocabulary such as gravity, gravitational pull and the heliocentric model. Understand that in the Solar System, the Sun has the greatest gravitational pull. This is why all planets orbit the Sun.</p> <p>Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Key question How is the Sun able to keep the planets in orbit?</p> <p>Vocabulary Sun model, orbit,</p> <p><u>Lesson 4 - Planet Earth</u> Understand that the Earth completes a full rotation on its axis once every 24 hours. This is why we have a 24</p>	<p><i>gases from the States of matter block LKS2.</i></p> <p>Explore the processes of filtering and sieving, which are used to separate certain mixtures. Children should work practically to learn that sieving is a method of separating materials based on size by passing a mixture, such as pebbles and sand, through a sieve. Filtration is used to separate an insoluble solid from a liquid, such as separating sand from water.</p> <p>Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Key question What type of mixture can be separated by sieving/filtering?</p> <p>Vocabulary Sieve filter paper mixture insoluble filtering funnel</p> <p><u>Lesson 3 -Solutions and evaporating</u> <i>Recap evaporation from LKS2 State of matter.</i> Explore the process of evaporation and how this can be used to separate a soluble solid from a liquid. Understand that “soluble” refers to a substance that can dissolve in a liquid to make a solution. Work practically by using scientific equipment to separate a soluble solid from a liquid by evaporation – teacher demonstration.</p> <p>Working scientifically Taking measurements, using a range of scientific equipment, with increasing</p>	<p>human offspring inherit characteristics from their parents, such as hair colour, eye colour and skin colour. Explore the concept that other animals inherit characteristics from their parents.</p> <p>Working scientifically Recording data and results of increasing complexity, using scientific diagrams and labels, classification keys, tables, scatter graphs, bar charts and line graphs.</p> <p>Key question What are some examples of characteristics in humans/animals?</p> <p>Vocabulary Characteristics inheritance offspring desirable characteristics</p> <p><u>Lesson 3 - Animal & Plant Adaptations</u> Learn about animal adaptations - understand that adaptations are characteristics which improve the chances of survival in a habitat. Explore specific adaptations of various animals and how these adaptations allow them to survive in their habitats. Explore how plants are adapted to survive in their habitats. Children learnt about the functions of plant parts in LKS2. In this lesson, they build on this knowledge to describe and explain how longer roots and larger stems are specific adaptations for plants to survive in desert environments.</p> <p>Working scientifically Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Key question</p>	<p>Working scientifically Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Key question What are the benefits of eating foods high in vitamins and minerals?</p> <p>Vocabulary Balanced diet processed ultra processed vitamins minerals</p> <p><u>Lesson 2 - Learn about drugs and their effects on the body.</u> This includes different drugs, such as painkillers, depressants and stimulants. children should be able to give examples of different drugs and their effects on the body. They should also explore the difference between legal and illegal drugs.</p> <p>Working scientifically Recognise which secondary sources will be most useful to research their ideas and begin the separate opinion from fact.</p> <p>Key question Why are some drugs legal and others are illegal?</p> <p>Vocabulary Drug stimulant painkiller depressant</p> <p><u>Lesson 3 -Learn about cigarettes and vaping.</u> This includes what cigarettes are made from, the dangers of smoking and vaping including their effects on the body. It is important that children look at the impact of smoking on the heart.</p> <p>Working scientifically Recognise which secondary sources will be most useful to research their ideas and</p>
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	<p>valves within veins that stop blood from flowing backwards. Explain that when blood flows into the heart, it flows into the atria at the top of the heart, then down into the ventricles, before leaving the heart again. Both the left and right sides of the heart pump at the same time, causing the heart to act as a double pump system.</p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.</p> <p>Key question How does the circulatory system work?</p> <p>Vocabulary Heart atria ventricles left/right atrium Left/right ventricle</p> <p><u>Lesson 5 - Oxygenated and deoxygenated blood</u> Know that one of the key roles of blood is to take oxygen to all parts of the body. Blood that has high levels of oxygen in it is known as “oxygenated blood”. Once this oxygen has been taken to the parts of the body, the blood contains little oxygen and is now known as “deoxygenated blood”. Blood continues to flow around the body so that oxygenated blood can reach the parts of the body, and deoxygenated blood can travel to the lungs to receive more oxygen.</p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas</p> <p>Key question How are veins and arteries the same/different</p>	<p>scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Key question What are the independent, dependent and controlled variables?</p> <p>Vocabulary independent variable dependent variable controlled variable</p> <p><u>Lesson 5 - Shadow experiment</u> Carry out an investigation to see how the distance of an object from a light source affects the size of the shadow.</p> <p>Working scientifically Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Key question Which variables will you control to make it a fair test?</p> <p>Vocabulary Light source variable opaque</p> <p><u>Lesson 6 - Shadow experiment evaluation</u> Answer the enquiry KQ and discuss how the distance from a light source affects the size of a shadow. Draw scientific diagrams to explain their findings from this experiment.</p> <p>Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Key question How does the distance from a light source affect the size</p>	<p>hour day. It is important that children are shown demonstrations of how the Earth rotates on its axis to challenge any misconceptions that they may have. Clarify to children that the Sun does not move, it is the Earth that moves and rotates.</p> <p>Working scientifically Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Key question What is the Earth’s axis?</p> <p>Vocabulary gravity, gravitational pull, heliocentric,</p> <p><u>Lesson 5 - Night and day</u> Explore the concept of night and day and how they occur with reference to the rotation of the Earth around its axis. As in the previous step, it is important that children are shown demonstrations of how night and day occur, to help address any misconceptions that they may have. Understand that it takes the Earth 24 hours to rotate around its axis. As the Earth rotates and one side faces the Sun, daytime occurs. When the Earth rotates and this side faces away from the Sun, night time occurs.</p> <p>Working scientifically Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Key question What causes day and night?</p> <p>Vocabulary geocentric, axis, north pole, south pole, rotation, day, night, satellite, moon</p> <p><u>Lesson 6 - The Moon</u></p>	<p>accuracy and precision, and taking repeat readings when appropriate.</p> <p>Key question What is a solution and how could you separate it?</p> <p>Vocabulary Solution dissolve soluble insoluble evaporation</p> <p><u>Lesson 4 - Reversible Changes</u> <i>Recap changes of state LKS2</i> Look at reversible changes. These are changes that can be reversed, such as dissolving and changes of state. If you can retrieve the substances that you started with, then the change is reversible.</p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas</p> <p>Key question What is a reversible change and can you give 2 examples of this?</p> <p>Vocabulary Mixture states of matter dissolve reversible change reverse</p> <p><u>Lesson 5 -Irreversible changing – burning</u> Focus on the irreversible change of burning. Once a material has been burnt, it cannot be changed back to its original form. It is essential that the children explore real life examples, such as burning a match / wick of a candle or burning sticks /bread in forest school <i>Health & safety – fire</i></p> <p>Working scientifically Use relevant scientific language and illustrations</p>	<p>What is meant by the term “adaptation” and can you name any animals/plants that have adapted?</p> <p>Vocabulary Characteristics adaptations habitat polar desert</p> <p><u>Lesson 4 - Evolution</u> Learn that evolution is a process where descendants develop different characteristics from their ancestors, creating new species. Children should understand that evolution allows organisms to survive and adapt to their environments.</p> <p>Working scientifically Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.</p> <p>Key question What is “evolution”?</p> <p>Vocabulary Characteristics adaptations habitat evolution</p> <p><u>Lesson 5 -Charles Darwin</u> Learn about Charles Darwin and his contributions towards the understanding of the process of evolution. Building on their knowledge of evolution from the previous step, they learn that different species of animals have evolved from a shared or common ancestor.</p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.</p> <p>Key question Who was Charles Darwin and why was his work so important?</p>	<p>begin to separate opinion from fact</p> <p>Key question Why is smoking cigarettes/vaping bad for you?</p> <p>Vocabulary Cigarette vape tar nicotine carbon monoxide addiction</p> <p><u>Lesson 4 - Plan a fair test to explore whether the duration of exercise affects heart rate.</u> Children should be encouraged to use a plan proforma in small groups, so that they get support in making a prediction and create a logical experiment plan. Carry out a fair test to explore how the duration of exercise affects heart rate. They should use their plans from the previous step to effectively carry out their investigation and obtain results for each duration of exercise. Evaluate their heart rate experiment. They should work scientifically to analyse data, make conclusions and evaluate their experiment. Answer the enquiry question and discuss the effect of the duration of exercise on heart rate. They should discuss why their heart rate increases and link back to learning about the circulatory system in the previous topic. <i>Next Step: You will learn more about drugs, diet and lifestyle as you move onto KS3.</i></p> <p>Working scientifically Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific</p>
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	<p>Vocabulary Blood vessels veins arteries capillaries</p> <p>Lesson 6 - Heart Dissection Carry out or observe a heart dissection to learn more about the physical structures of the heart and how they help with its function. Remind children that the heart is split into four chambers. The left side of the heart is thicker than the right, meaning it is a stronger muscle, because it must pump with greater force in order to move oxygenated blood around the whole body. <i>Next Step: You will explore more of the body's systems as you move on to KS3.</i></p> <p>Working scientifically 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.</p> <p>Key question What is the physical difference between the sides of the heart?</p> <p>Vocabulary Heart atria ventricles dissection</p>	<p>of the shadow?</p> <p>Vocabulary light source shadow opaque conclusion evaluate</p> <p>Lesson 7 - Refraction Explore how light can change direction when it travels from one medium to another. Explore how refraction occurs and create simple explanations of why this happens.</p> <p>Working scientifically Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Key question What is refraction?</p> <p>Vocabulary refraction medium transparent lens</p> <p>Lesson 8 - Exploring light Explore the concept of “white light”. Identify how white light can be separated into different colours. They can use their understanding of refraction from KQL7 and use a prism to separate white light into its different colours. Identify that the prism changes the direction of each colour at slightly different angles. This allows us to see the colours individually. <i>Next Step: You will explore light further as you move onto KS3.</i></p> <p>Working scientifically Talk about how scientific ideas have changed over time (non statutory).</p> <p>Key questions What is a rainbow and how is it formed?</p> <p>Vocabulary Refraction Prism Coloured filter Spectrum of light</p>	<p>Explore the Moon and its features. This includes what the Moon looks like, its surface and how long it takes to orbit the Earth. Understand that the Moon orbits the Earth and stays in orbit due to the Earth's gravitational pull. They will also learn that other planets have their own moons and some have multiple moons. <i>Next Step: You won't look in detail at space again until KS3, where you will be able to apply your knowledge.</i></p> <p>Working scientifically Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Key question Approximately how many days does it take for the Moon to orbit the Earth?</p> <p>Vocabulary Satellite Moon Gravity Gravitational pull Orbit</p>	<p>to discuss, communicate and justify their scientific ideas</p> <p>Key question Why is burning an irreversible change?</p> <p>Vocabulary Chemical reaction reversible change irreversible burning heating</p> <p>Lesson 6 - Irreversible Changes - Acid Learn that irreversible changes are changes that cannot be reversed. They are chemical changes, which means that at least one new substance is made. Children will be looking at the reaction between an acid and bicarbonate of soda. For safety, the acid used for this reaction can be vinegar. The reaction of rocks with acid was explored in LKS2. Children should react an acid with bicarbonate of soda and find that it fizzes. This means that a gas has been made. Fizzing is one sign that a chemical reaction has taken place, and a new substance (such as a gas) is made. <i>Health & safety Vinegar can cause irritation to the skin and eyes, so care must be taken when using it. Next Step: You won't look in detail at materials again until KS3, where you will be able to apply your knowledge.</i></p> <p>Working scientifically Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Key question What is meant by a “chemical reaction”?</p> <p>Vocabulary Chemical reaction vinegar</p>	<p>Vocabulary Charles Darwin common ancestor evolution species theory</p> <p>Lesson 6 - Natural Selection Learn about natural selection for the first time. Children do not need to refer to “genes” or “chromosomes” when exploring natural selection. Instead, they should refer to the characteristics of animals and plants being passed onto the next generation. Understand that natural selection can lead to variation in characteristics within a species. This may lead to certain characteristics being more advantageous for survival and reproduction. An example of this is the peppered moth, where variations in colouration contributed to the moth's ability to survive in its habitat.</p> <p>Working scientifically Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact</p> <p>Key question What is “natural selection”?</p> <p>Vocabulary Charles Darwin natural selection adaptation habitat</p> <p>Lesson 7 - Darwin's Finches Learn about Darwin's observations on the Galapagos Islands and his work on finches.</p> <p>Working scientifically Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in</p>	<p>equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Using test results to make predictions to set up further comparative and fair tests.</p> <p>Key question How does the duration of exercise affect heart rate?</p> <p>Vocabulary Independent variable dependent variable controlled variable circulatory system heart rate duration exercise</p>
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				acid bicarbonate of soda irreversible change	<p>oral and written forms such as displays and other presentations.</p> <p>Key question Is the type of food a bird eats related to the shape of its beak?</p> <p>Vocabulary Galapagos Islands finches adaptation evolution Charles Darwin</p> <p>Lesson 8 - Fossils Revisit and deepen their understanding of fossilisation (LKS2) Use their understanding of fossil formation to explore a variety of fossils and what scientists can learn from them. Link this learning to evolution as fossils provide valuable evidence to show how organisms have evolved over time. Link palaeontology to Mary Anning. <i>Next Step: You will explore evolution further as you move onto KS3.</i></p> <p>Working scientifically Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.</p> <p>Key question How have fossils changed over time and does this provide evidence for evolution?</p> <p>Vocabulary Fossil rock Charles Darwin evolution palaeontology</p>	
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