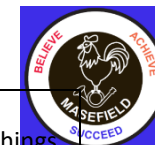




The national curriculum for science aims to ensure that all pupils:

End of EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
<p><b>Understanding the World</b> <b>ELG: The natural World</b></p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>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.</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p>The principal focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly - constructed world around them.</p> <p>They should be encouraged to be curious and ask questions about what they notice.</p> <p>They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.</p> <p>They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through</p>	<p>The principal focus of science teaching in Lower Key Stage 2 is to enable pupils to broaden their scientific view of the world around them.</p> <p>They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions.</p> <p>They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.</p> <p>They should draw simple conclusions and use some scientific language, first,</p>	<p>The principal focus of science teaching in Upper Key Stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas.</p> <p>They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.</p> <p>At Upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates.</p> <p>They should also begin to recognise that scientific ideas change and develop over time.</p> <p>They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over</p>



	<p>the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.</p> <p>‘Working scientifically’ is described separately in the programme of study, but must <b>always</b> be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.</p> <p>Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.</p>	<p>to talk about and, later, to write about what they have found out.</p> <p>‘Working scientifically’ is described separately at the beginning of the programme of study, but must <b>always</b> be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.</p> <p>Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.</p>	<p>different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.</p> <p>‘Working and thinking scientifically’ is described separately at the beginning of the programme of study, but must <b>always</b> be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.</p> <p>Pupils should read, spell and pronounce scientific vocabulary correctly.</p>
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## Overview of Science Content

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	<b>Physics: Seasonal Changes</b> (Throughout the year)	<b>Chemistry: Everyday Materials</b>		<b>Biology: Animals, Including Humans</b>	<b>Biology: Plants</b>	
	Working Scientifically: Record Is the weather the same every day?	Working Scientifically: Explore Are all materials the same?		Working Scientifically: Enquire Are all animals totally different?	Working Scientifically: Explain What parts is a plant made of?	
	Key Scientist Robert Fitzroy			Biography: Key Scientist Steve Irwin		
	Y1 Seasonal Changes LBQ Assessment	Y1 Everyday Materials LBQ Assessment		Y1 Animals, Including Humans LBQ Assessment	Y1 Plants LBQ Assessment	
Year 2	<b>Biology: Living Things &amp; their Habitats</b>	<b>Chemistry: Uses of everyday materials</b>	<b>Biology: Animals, Including Humans</b>		<b>Biology: Plants</b>	
	Working Scientifically: Explain Is everything on Earth alive?	Working Scientifically: Record What materials could be used to make a good raincoat	Working Scientifically: Enquire Do all animals start off small?		Working Scientifically: Explore Do plants grow the same amount every day?	
		Biography: Key Scientist John Boyd Dunlop	Key Scientist Joan Beauchamp Procter			
	Y1 Living Things and Their Habitats LBQ Assessment	Y1 Materials LBQ Assessment	Y1 Animals, Including Humans LBQ Assessment		Y2 Plants LBQ Assessment	
Year 3	<b>Chemistry: Rocks</b>	<b>Physics: Light</b>	<b>Physics: Forces and Magnets</b>	<b>Biology: Animals, Including Humans</b>	<b>Biology: Plants</b>	
	Working Scientifically: Enquire Are all rocks made in the same way?	Working Scientifically: Record Why do shadows change during the day?	Working Scientifically: Explore Are all metals attracted to magnets?	Working Scientifically: Enquire How does our body move and stand up?	Working Scientifically: Explain Do all plants need exactly the same things?	
	Biography: Key Scientist	Key Scientist	Key Scientist	Key Scientist	Key Scientist	



	Mary Anning		Michael Faraday		Beatrix Potter	
	LBQ Vocabulary: <b>10626</b>	LBQ Vocabulary: <b>11262</b>	LBQ Vocabulary: <b>11040</b>	LBQ Vocabulary: <b>10711</b> LBQ Vocabulary: <b>10596</b>	LBQ Vocabulary: <b>10565</b> LBQ Vocabulary: <b>10512</b>	
	<b>10669</b> : Fossil Formation <b>10927</b> : Rock properties and uses	<b>11262</b> : Light and Dark <b>11253</b> : Shadows	<b>10894</b> : Forces <b>11256</b> : Magnets	<b>10560</b> : Different Animal Diets <b>10605</b> : Skeletons, Muscles and Joints <b>11498</b> : Food and Diet: Food Groups	<b>11258</b> : What Plants Need to Grow <b>10500</b> : Life Cycle of a Flowering Plant	
Year 4	Physics: Sound	Physics: Electricity	Chemistry: States of Matter	Biology: Living Things and Their Habitats	Biology: Animals, Including Humans	
	Fair Testing: Enquire How do instruments make different sounds?	Fair Testing: Explain Does Electricity flow easily through all objects?	Fair Testing: Explore Does water always melt at the same speed?	Fair Testing: Record Are some animals more alike than others?	Fair Testing: Enquire Digestion investigation	
	Key Scientist	Key Scientist Benjamin Franklin	Key Scientist	Biography: Key Scientist David Attenborough	Key Scientist	
	N/A	LBQ Vocabulary: <b>11034</b>	LBQ Vocabulary: <b>10629</b>	LBQ Vocabulary: <b>10499</b> LBQ Vocabulary: <b>10550</b> LBQ Vocabulary: <b>10607</b>	LBQ Vocabulary: <b>10451</b>	
	<b>11251</b> : Sound <b>11272</b> : Changing the Volume of a Sound <b>11257</b> : Changing the Pitch of a Sound	<b>10893</b> : Electrical Circuits	<b>10638</b> : Processes of Changing State <b>10642</b> : Properties of Solids, Liquids and Gases <b>11250</b> : The Water Cycle	<b>10548</b> : Parts of a Food Chain <b>10496</b> : Classification Keys and Grouping Organisms <b>10608</b> : Environmental Changes in Habitats	<b>10452</b> : The Human Digestive System <b>10455</b> : Types and Functions of Teeth	
Year 5	Physics: Forces	Physics: Earth and Space	Biology: Living Things and Their Habitat	Chemistry: Properties and Changes of Materials	Biology: Animals including humans	
	Fair Testing: Explore How do parachutes work?	Fair Testing: Record What shape is the moon and does it change?	Fair Testing: Explain If life has existed for billions of years, why are there still people alive today?	Fair Testing: Enquire Is it possible to separate materials?	Fair Testing: Explain	
	Biography: Key Scientist Galileo Galilei Isaac Newton	Key Scientist Galileo Galilei	Key Scientist	Key Scientist Marie Curie	Key Scientist	
	N/A	LBQ Vocabulary: <b>10653</b>	LBQ Vocabulary: <b>10577</b> LBQ Vocabulary: <b>10492</b>	LBQ Vocabulary: <b>10888</b>	N/A	
	<b>11255</b> : Friction <b>10171</b> : Gravity and the Difference Between Mass and Weight	<b>10652</b> : Earth, Sun and Moon <b>11261</b> : Our Solar System <b>10654</b> : Relative Movement of the Moon and Earth	<b>10570</b> : Comparing Life Cycle of Different Animals <b>11259</b> : Parts of a Flower <b>10557</b> : Plant Reproduction	<b>10666</b> : Irreversible Changes (Levels 1-2 Q1-13) <b>10662</b> : Separating Solutions (Levels 1-2 Q1-16) <b>10698</b> : Dissolving (Q1-19) <b>10661</b> : Reversible changes (Level 1 Q1-8)	<b>10575</b> : Life Cycle of a Human	





Year 6	Biology: Animals, Including Humans	Physics: Electricity	Biology: Evolution and Inheritance		Physics: Light	Biology: Living Things and Their Habitats
	Fair Testing: Explore Is our heart rate always the same?	Fair Testing: Enquire Is it possible to change how bright a bulb is?	Fair Testing: Explain Why do species of animals look different?		Fair Testing: Enquire Why can I hear round corners but not see round corners?	Fair Testing: Record Classification
			Biography: Key Scientist Charles Darwin Jane Goodall		Key Scientist	Key Scientist Carl Linnaeus
	LBQ Vocabulary: <b>10630</b>	LBQ Vocabulary: <b>10891</b>	LBQ Vocabulary: <b>10627</b>		LBQ Vocabulary: <b>11254</b>	LBQ Vocabulary: <b>10551</b>
	<b>11263:</b> The human circulatory system <b>11264:</b> The heart and the blood	<b>11045:</b> Cells and Circuits	<b>10648:</b> Evolution		<b>11214:</b> How Light Travels and How We See	<b>10480:</b> Grouping Organisms: Plants, Animals and Microorganisms



<b>EYFS - Understanding of the World</b>	
<b>3 &amp; 4 Year Olds</b>	<ul style="list-style-type: none"><li>• Use all their senses in hands-on exploration of natural materials.</li><li>• Explore collections of materials with similar and/or different properties.</li><li>• Talk about what they see, using a wide vocabulary.</li><li>• Plant seeds and care for growing plants.</li><li>• Understand the key features of the life cycle of a plant and an animal.</li><li>• Begin to understand the need to respect and care for the natural environment and all living things.</li><li>• Explore and talk about different forces they can feel</li><li>• Talk about the differences between materials and changes they notice.</li></ul>
<b>Reception</b>	<ul style="list-style-type: none"><li>• Explore the natural world around them.</li><li>• Describe what they see, hear and feel whilst outside.</li><li>• Recognise some environments that are different from the one in which they live.</li><li>• Understand the effect of changing seasons on the natural world around them.</li></ul>
<b>Early Learning Goals</b>	<ul style="list-style-type: none"><li>• Explore the natural world around them, making observations and drawing pictures of animals and plants;</li><li>• 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;</li><li>• Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</li></ul>




Term:	Y1 – Autumn then throughout the year.	Key Text(s):	 
Scientist Study:	<b>Robert Fitzroy</b> (1805-1865) English captain of HMS Beagle, the ship on which Charles Darwin travelled to the Galapagos Islands. He was a meteorologist, using his knowledge of weather helped him to establish the Met Office.		
Unit Title:	<b>Physics: Seasonal Changes</b>  <u>Context for study:</u> This unit follows on from work in Reception where pupils study the names of the 4 seasons and look at changes to trees and plants during this time as each season occurs. In year 1 they begin to learn more about the 4 seasons, including the months that fall into each season and the weather patterns they follow. They will learn about the changes to the earth’s light patterns through the seasons and how the seasons affect animals and plants. This unit comes before work studied in year 2 about what plants need to grow well and when plants grow best. They review work studied in year 1 about common plants and how seasons affect deciduous and evergreen plants.  <b>Working Scientifically:</b> Record: Is the weather the same every day?		
<b>Key Vocabulary for the Unit:</b> <b>Season:</b> Different times of the year, where weather patterns change along with temperature. The seasons are spring, summer, autumn and winter. <b>Spring:</b> The time of year between March and May. There is usually lots of signs of new growth in Spring. <b>Summer:</b> The hottest season in the UK. It happens between June and August. <b>Autumn:</b> Leaves fall off of trees, the days become shorter and in begins to get colder and wetter. <b>Winter:</b> The coldest season in the UK. Usually have snow in this season. Occurs between December and February. <b>Day:</b> The time where sunlight can be seen. <b>Night:</b> Between sunrise and sunset, where it is dark. <b>Weather:</b> Weather is what the sky and the air outside are like, such as cold and cloudy.			
<b>NC Objectives</b>	<b>Knowledge Content</b>		<b>Working Scientifically</b>
Observe changes across the four seasons.	Know that there are 4 seasons - Autumn, Winter, Spring and Summer. Know that the seasons occur in a cycle and that they consist of months of the year. Know how the environment changes in each season.		Know how to gather information on rainfall and temperature at each season



<p><i>Observe and describe weather associated with the seasons and how day length varies.</i></p> <p><i>Working Scientifically:</i></p> <p><i>Gathering and recording data to help in answering questions.</i></p>	<p>Autumn - Leaves change colour and fall from deciduous trees, harvest time, some birds migrate (e.g. swallows)</p> <p>Winter - Some animals including hedgehogs and tortoises hibernate throughout Winter (identify these animals) water freezes to ice. Many plants stop growing.</p> <p>Spring - Flowers begin to grow, associated with rebirth and growth, some baby animals are born (e.g. lambing season),</p> <p>Summer - Flowers and trees are in bloom.</p> <p>(Time-lapse video of seasons - <a href="https://vimeo.com/2639782">https://vimeo.com/2639782</a>)</p> <p>Know that the length of daylight varies with Winter having the shortest daylight hours and Summer having the longest.</p> <p>Know that the Earth orbits the Sun with one orbit constituting a year of 365 days</p> <p>Know the weather patterns associated with each season -</p> <p>Autumn - Temperatures start to drop from Summer, overcast</p> <p>Winter - Coldest time of year, snow, frosty in the morning, sleet, blizzard, hail</p> <p>Spring - Temperatures start to warm up</p> <p>Summer - Hottest time of the year, sunshine, generally dry weather but may be thunderstorms</p>	<p>Know that a thermometer is used to measure temperature. Know how to read a thermometer to find out the temperature outside.</p> <p>Know that we measure temperature in degrees Celsius which is abbreviated to °C.</p> <p>Know that when the temperature falls below 0°C then water turns to ice.</p> <p>Know that the temperature on earth is affected by the sun.</p>
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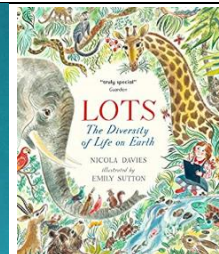


Term:	Y1 – Autumn 2	Key Text(s):	
Scientist Study:	N/A		
Unit Title:	<b>Chemistry: Uses of Everyday Materials</b>  <b><u>Context for study:</u></b> This unit is the first of five science units where pupils study materials as part of the discipline of chemistry - the identification of the properties a substance is made from. In this Year 1 unit, pupils identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Pupils distinguish between an object and the material from which it is made including if it is 'man-made' or 'natural'. New learning includes describing the simple physical properties of a variety of everyday materials. The knowledge acquired will help pupils at the end of the unit as they compare and group together a variety of everyday materials on the basis of their simple physical properties. This unit is the precursor to work in Year 2 as pupils compare the suitability of objects and compare how things move on different surfaces.  <b><u>Working Scientifically:</u></b> Explore: Are all materials the same?		
<b><u>Key Vocabulary for the Unit:</u></b> <b>Rough:</b> Something that feels and looks bumpy. <b>Property:</b> How a material behaves. <b>Smooth:</b> A flat surface that is not bumpy or rough. <b>Material:</b> What an object is made out of. Example: metal, plastic, glass. <b>Hard:</b> Not easily broken, bent or squashed. <b>Soft:</b> Easy to cut, bend and fold. Its shape can be changed easily. <b>Stretchy:</b> It can be made longer without snapping. <b>Dull:</b> A surface which doesn't reflect light. It is not bright or shiny. <b>Waterproof:</b> Water cannot go through the material. Things underneath stay dry. <b>Bendy:</b> Can be bent side to side without snapping. <b>Stiff:</b> Doesn't bend easily.			



NC Objectives	Knowledge Content	Working Scientifically
<p><i>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</i></p> <p><i>Describe the simple physical properties of a variety of everyday materials.</i></p> <p><i>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</i></p> <p><i>Working scientifically:</i></p> <p><i>Observing closely, using simple equipment</i></p> <p><i>Performing simple tests</i></p>	<p>Know that matter (stuff) is made from tiny building blocks. This comes in three forms - solids, liquids and gases.</p> <p>Solids include glass, plastic and stone.</p> <p>Liquids include water, blood, milk.</p> <p>Gas includes air that we breathe.</p> <p>Know that many materials are solid and have different properties.</p> <p>Water is a liquid and is different because it can change its shape.</p> <p>Know that some materials are natural and others are man-made. Natural materials come from materials found in nature and man-made materials are those which humans make.</p> <p>Natural materials: iron, gold, silver, silk, cotton, leather, wood, water and rock. (know that iron, gold, silver are collectively known as metals)</p> <p>Man-made materials: plastic, glass (know that glass is heated sand), brick, paper, concrete, rubber and some metals like steel.</p> <p>Identify different items and name what material or materials they are made from. e.g. Canoe: wood or plastic. Car: metal and rubber tyres.</p>	<p>Test a range of materials and identify which properties they have.</p> <p>Group materials based on similar properties.</p>



Term:	Y1 – Spring 2	Key Text(s):	 
Scientist Study:	<b>Steve Irwin</b> (1962-2006) Australian television personality, environmentalist and wildlife expert nicknamed ‘The Crocodile Hunter.’		
Unit Title:	<b>Biology: Animals, Including Humans</b>  <b><u>Context for study:</u></b> This unit is the first of eight science units where pupils study animals, including humans, as part of the discipline of biology - the study of living organisms. From Reception, pupils can name common animals and their babies. Pupils also know that animals that live in particular habitats and know some common features of mini beasts. In Year 1, pupils further develop their knowledge of animals as they are introduced to the concept of ‘families’ and how animals are grouped according to their shared properties including fish, amphibians, reptiles, birds and mammals. Pupils learn the key features of each animal family and group them into their correct families. New learning includes identifying and naming a variety of common animals that are carnivores, herbivores and omnivores. Pupils identify, name, draw and label the basic parts of the human body. Pupils also learn about the senses. This unit is the precursor to work studied in Year 2 where pupils learn about how animals, and humans, grow and change. Pupils study life cycles of humans and animals such as butterflies, chickens and frogs.  <b><u>Working Scientifically:</u></b> Enquire: Are all animals totally different?		
<b><u>Key Vocabulary for the Unit:</u></b> <b>Mammal:</b> Warm-blooded creatures which have fur, breathe air and give birth to live young (no eggs). <b>Fish:</b> A scaly skinned creature with a spine (back bone) which swims under water and breathes using gills. <b>Reptile:</b> Cold-blooded animals which mostly lay eggs and have hard, dry scales covering their body. Most live on land, but some, such as the turtle, live in water. All reptiles breathe air. <b>Bird:</b> Feathered animals which have warm-blooded and lay eggs. Most, but not all, species of birds can fly. <b>Amphibian:</b> These creatures begin life in water as eggs, have a tadpole-like stage before spending most of their adult life on both land and in water. They have both lungs and gills. Example: Frog <b>Herbivore:</b> Animals which only eat plants.			



**Carnivore:** Animals which hunt and eat other animals (meat).

**Omnivore:** An animal which eats both meat and plants.

**Nocturnal:** Animals which spend most of their lives awake during the night and sleeping during the day.

**Human:** Another word for people. Humans belong to the group of animals called mammals.

**Pet:** An animal which lives with people in their homes.

**Senses:** We use our senses to discover what is around us. There are five senses – sight, hear, smell, taste and touch.

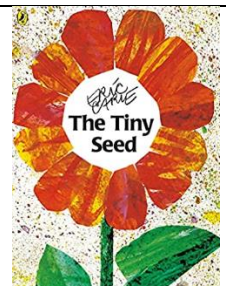
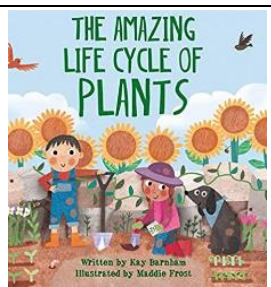
NC Objectives	Knowledge Content	Working Scientifically										
<p><i>Pupils will be taught to:</i></p> <p><i>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</i></p> <p><i>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</i></p> <p><i>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</i></p> <p><i>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</i></p> <p><i>Working scientifically:</i></p> <p><i>Asking simple questions and recognising that they can be answered in different ways</i></p> <p><i>Identifying and classifying</i></p>	<p>Pupils will know that animals are grouped together in ‘families’ based on shared properties. They will name the groups fish, amphibians, reptiles, birds and mammals. Know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are known as vertebrates, which means they are animals that have a backbone. Understand the difference between a pet and a wild animal.</p> <table><tr><th>Mammals</th><th>Fish</th><th>Bird</th><th>Reptile</th><th>Amphibian</th></tr><tr><td>Mouse Fox Badger Squirrel Hedgehog  <u>Wider World</u> Elephant Tiger Gorilla Lion Orangutan</td><td>Carp Stickleback  <u>Wider World</u> Cod Tuna Salmon</td><td>House Sparrow Blackbird Magpie Starling Robin  <u>Wider World</u> Flamingo Penguin Macaw Pelican Emu</td><td>Common lizard Adder Grass snake  <u>Wider World</u> Iguana Chameleon Crocodile Alligator</td><td>Common toad Common frog Smooth newts  <u>Wider World</u> Poison dart frog</td></tr></table> <p>Know the features of a fish - gills, scales, fins, water dwelling</p> <p>Know the features of mammals - hair or fur, babies drink mother’s milk, live on land or water</p> <p>Know the features of amphibians - live on land or water when adults, soft skin, lay eggs in water, live in water when young</p> <p>Know the features of reptiles - dry scaly skin, lay eggs on land</p> <p>Know the features of birds - wings, feathers, beak/bill, hatch from eggs, most can fly but some can’t (e.g., ostrich, penguin, kiwi)</p> <p>Parts of the human body</p>	Mammals	Fish	Bird	Reptile	Amphibian	Mouse Fox Badger Squirrel Hedgehog  <u>Wider World</u> Elephant Tiger Gorilla Lion Orangutan	Carp Stickleback  <u>Wider World</u> Cod Tuna Salmon	House Sparrow Blackbird Magpie Starling Robin  <u>Wider World</u> Flamingo Penguin Macaw Pelican Emu	Common lizard Adder Grass snake  <u>Wider World</u> Iguana Chameleon Crocodile Alligator	Common toad Common frog Smooth newts  <u>Wider World</u> Poison dart frog	<p>Sorting animals into the correct classification</p> <p>Know that objects can be identified or sorted into groups based on their observable properties</p> <p>Know that we can write down numbers and words or draw pictures to record what we find.</p> <p>Know that herbivorous animals eat plants; a carnivorous animal eats other animals; omnivorous animals eat both animals and plants</p> <p>Know that a cat is an example of a carnivore; that a rabbit is an example of a herbivore; know that many humans are examples of omnivores (though not vegetarians)</p>
Mammals	Fish	Bird	Reptile	Amphibian								
Mouse Fox Badger Squirrel Hedgehog  <u>Wider World</u> Elephant Tiger Gorilla Lion Orangutan	Carp Stickleback  <u>Wider World</u> Cod Tuna Salmon	House Sparrow Blackbird Magpie Starling Robin  <u>Wider World</u> Flamingo Penguin Macaw Pelican Emu	Common lizard Adder Grass snake  <u>Wider World</u> Iguana Chameleon Crocodile Alligator	Common toad Common frog Smooth newts  <u>Wider World</u> Poison dart frog								



Know that we have five senses - smell, taste, touch, sight, hearing  
Know that the following body parts are linked to the senses.

Sense	Part of the body
sight	eyes
smell	nose
touch	hands, feet, arms, legs etc
hearing	ears
taste	tongue

Know why we need the following body parts - ears, mouth, eyes, nose, tongue.  
Know that the brain controls the body and is where you think and remember things.  
Know the location of the brain.

Term:	Y1 – Spring 2	Key Text(s):		
Scientist Study:	N/A			
Unit Title:	<b>Biology: Plants</b>  <u><b>Context for study:</b></u> This unit follows on from learning in Reception about the seasons and changes that happen to the plants during those seasons. They have also recognised some fruits and vegetables and named the basic parts of a plant (petals, stem, flower, roots). In year 1 the pupils learn about the names of common plants and trees and learn to identify them by their leaves. They learn about the terms ‘evergreen’ and ‘deciduous’ and how deciduous plants fit into the change of the seasons. This unit is the precursor to work studied in year 2 where pupils will recap common plants and trees studied in year 1 before moving onto how plants grow (including germinations and pollination), what they need to grow healthily and differences between bulbs and seeds.  <b>Working Scientifically:</b> Explain: What parts is a plant made of?			
<b>Key Vocabulary for the Unit:</b> <b>Plant:</b> A living thing which uses leaves to capture sunlight to make sugars. Example: trees, grass, daisy. <b>Deciduous:</b> A tree or bush which loses its leaves in autumn each year. Example: oak tree. <b>Evergreen:</b> A tree or bush that keeps its leaves all year round, even during the winter months. Example: cedar. <b>Trunk:</b> The thick, woody stem of a tree. They are covered in bark. <b>Root:</b> Part of the plant which takes in water and nutrients from the soil. <b>Branch:</b> The woody, bark-covered parts of trees which join leaves and twigs to the trunk. <b>Twig:</b> A thin part of the branch, with leaves joined to the end. <b>Stem:</b> These hold the plant up and join all parts of the plant together. They carry water, sugars and nutrients to all parts of the plant. <b>Seed:</b> Seeds grow into new plants. Example: Sunflower. <b>Blossom:</b> Small flowers which grow of bushes and trees. <b>Wild Plants:</b> These plants grow wherever seeds fall. They do not need to be planted. <b>Garden Plants:</b> Plants chosen and planted in a place by people.				



**Weeds:** Wild plants growing where people don't want them to grow.

**Flowers:** Used to attract insects using brightly coloured petals. Fruits grow from flowers.

**Fruit:** These grow from flowers and contain the plant's seeds. They are often sweet tasting so that animals eat them. Example: apple.

**Bulb:** Bulbs are short, fat stems which grow into new plants. Example: Daffodils.

**Leaf / Leaves:** The part of a plant which captures sunlight.


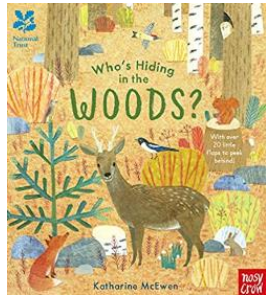
NC Objectives	Knowledge Content	Working Scientifically												
<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>Working scientifically:</p> <p>Asking simple questions and recognising that they can be answered in different ways</p> <p>Observing closely, using simple equipment</p> <p>Identifying and classifying</p> <p>Using their observations and ideas to suggest answers to questions</p>	<p>Know the names of the following common plants - daisy, white clover, poppy, nettle, ivy, bramble and locate some in the local environment (also dandelion and grass).</p> <p>Know the names of the following common trees - oak, elm, maple, silver birch, sycamore, horse chestnut.</p> <p>Know how to identify them from their leaves, fruit and shape.</p> <p>Know how to identify some of the trees in the grounds of Masefield Primary School</p> <p>Know the term deciduous - a tree that sheds its leaves annually - this means every year the tree loses its leaves. The leaves of deciduous trees are often large and thin.</p> <p>Know the term Evergreen - a tree that has green leaves all year. These leaves are usually, waxy, thick, narrow and small.</p> <p>Know that oak, birch and sycamore are deciduous</p> <p>Know that holly and pine are evergreen.</p> <p>Know the names of the basic parts of a plant and their function - leaves, flower, stem, roots, petals</p> <table><tr><th>part</th><th>function</th></tr><tr><td>leaves</td><td>collect energy from the sun to help the plant grow</td></tr><tr><td>flower</td><td>creates seeds</td></tr><tr><td>stem</td><td>holds the flower and leaves up high and transports water</td></tr><tr><td>root</td><td>collects nutrients and water from the soil to help the plant grow</td></tr><tr><td>petals</td><td>the coloured part of a flower that attracts insects</td></tr></table> <p>Know how to draw a diagram showing the parts of a plant.</p>	part	function	leaves	collect energy from the sun to help the plant grow	flower	creates seeds	stem	holds the flower and leaves up high and transports water	root	collects nutrients and water from the soil to help the plant grow	petals	the coloured part of a flower that attracts insects	<p>Know how to observe a plant growing in a transparent glass vase.</p> <p>Know how to record observations about the roots and stem growing.</p> <p>Know how to use a magnifying glass to study flowers and plants closely</p> <p>Know how to record information about these flowers.</p>
part	function													
leaves	collect energy from the sun to help the plant grow													
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root	collects nutrients and water from the soil to help the plant grow													
petals	the coloured part of a flower that attracts insects													



	<p>Know the names and function of parts of a tree - roots, trunk, branches, leaves.</p> <p>Know that a tree trunk is a type of stem.</p> <p>Know that flowers on a tree are often called blossom.</p> <p>Know that fruit often grows on trees including - apples, oranges, cherries, lemons, bananas, mangoes, pears and plums.</p> <p>Know that the fleshy part of the fruit generally protects the seeds within.</p> <p>Recognise examples of seeds and pips found in apples, oranges, peaches and cherries.</p> <p>Know that seeds are buried in the ground (or planted) and grow into new plants.</p> <p>Know that bulbs are short stems with leaves built up around it.</p> <p>They are planted in the ground and new plants can grow.</p> <p>Know that onions are an example of a bulb that we can eat.</p>	
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Term:	Y2- Autumn 1	Key Text(s):	 
Scientist Study:	N/A		
Unit Title:	<b>Biology: Living Things and their Habitats</b>  <b>Context for study:</b> Prior to this unit pupils will have already started to study habitats by looking at minibeasts in Reception. In year 2 pupils will learn about the food chains of animals in varying habitats and will look at microhabitats and the animals that live there. They will also learn how to determine if something is alive, was once alive or never lived, using the acronym MRS NERG. This unit comes before work in Year 3 studying the animals native to sea, river and canals and the features that help them to live there. In year 4 pupils will continue learning about habitats by grouping animals into categories, such as vertebrates/invertebrates, before moving onto work in year 5, studying adaptation and eco-systems.  <b>Working Scientifically:</b> Explain: Is everything on Earth alive?		
<b>Living:</b> Something that is alive and not dead. <b>Non-Living:</b> Things that have never been alive. <b>Dead:</b> Were once alive but not anymore. <b>Animal:</b> Creatures which must eat other living things. These include, birds, mammals, reptiles, spiders, insects, amphibians, worms and fish. <b>Habitat:</b> The home or environment of a living thing. For example: a woodland could be the environment for a badger. <b>Food Chain:</b> This shows us what different living things eat and in what order. <b>Prey:</b> Animals which are eaten by predators. <b>Predator:</b> Animals which hunt and eat other animals. <b>Carnivore:</b> Animals which eat only meat. <b>Herbivore:</b> Animals which only eat plants. <b>Omnivore:</b> Animals which eat both plants and animals.			



**Human:** People. Humans are mammals.

**Micro-Habitat:** A small area of the larger habitat. For example: A rotting log can be a micro-habitat within a woodland.

NC Objectives	Knowledge Content	Working Scientifically																					
<p><i>Explore and compare the differences between things that are living, dead, and things that have never been alive.</i></p> <p><i>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.</i></p> <p><i>Identify and name a variety of plants and animals in their habitats, including microhabitats.</i></p> <p><i>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.</i></p> <p><i>Working scientifically:</i></p> <p><i>Observing closely, using simple equipment.</i></p> <p><i>Identifying and classifying.</i></p> <p><i>Using their observations and ideas to suggest answers to questions.</i></p>	<p>To know which items, including those made from a variety of materials, fit into each category and place them in a table under the headings  living (tree, person, animal, fish, grass)  dead (paper, bunch of flowers, cotton shirt, wooden table)  never been alive (plastic chair, pen, window, stone, metal)  Understand that a flame is not alive and that a deciduous tree is not dead in Winter.</p> <p>Know that living things move, grow, consume nutrients and reproduce; that dead things used to do these things but no longer do; and that things that never lived have never done these things.</p> <p>Know the acronym MRS NERG (Movement, Respiratory, Sensitivity, Nutrition, Excretion, Reproduction and Growth) to teach about how to organise objects into each category.</p> <p>Know the meaning of these terms from this table:</p> <table border="1" data-bbox="577 826 1451 1225"> <tbody> <tr> <td>M</td><td>Movement</td><td>All living things move, even plants.</td></tr> <tr> <td>R</td><td>Respiration</td><td>Getting energy from food.</td></tr> <tr> <td>S</td><td>Sensitivity</td><td>Detecting changes in the surroundings.</td></tr> <tr> <td>G</td><td>Growth</td><td>All living things grow.</td></tr> <tr> <td>R</td><td>Reproduction</td><td>Making more living things</td></tr> <tr> <td>E</td><td>Excretion</td><td>Getting rid of waste.</td></tr> <tr> <td>N</td><td>Nutrition</td><td>Taking in and using food.</td></tr> </tbody> </table> <p>Know that a species of animal or plant that is extinct no longer has any living members in the world. e.g. dinosaurs, dodo.</p> <p>Know that all creatures need air, food, shelter and water to survive  1. Sea/underwater - A fish breathes through gills, has fins to swim, swim bladders for buoyancy, eat water insects and other sea creatures (shrimp)</p>	M	Movement	All living things move, even plants.	R	Respiration	Getting energy from food.	S	Sensitivity	Detecting changes in the surroundings.	G	Growth	All living things grow.	R	Reproduction	Making more living things	E	Excretion	Getting rid of waste.	N	Nutrition	Taking in and using food.	<p>Use questions to sort different animals based on their characteristics and habitat.</p> <p>Pupils should look at some habitats and microhabitats in the local area and record their findings.</p> <p>Use the terms Solar Energy, Producer, Consumer, Prey, Predator to describe a food chain and use the terminology to organise and create food chains.</p> <p>Know the following food chains:</p> <ol style="list-style-type: none"> <li>1. Sunlight, Clover, Snail, Songbird and Falcon</li> <li>2. Sunlight, Ash Tree, Greenfly, Frog, Snake</li> <li>3. Sunlight, Lettuce, Slug, Frog, Fox</li> </ol>
M	Movement	All living things move, even plants.																					
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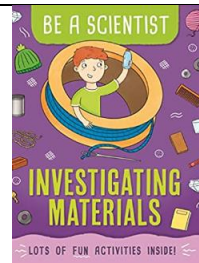
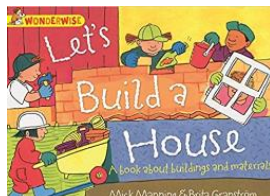
2. Woodland - A fox/badger, breathes through lungs, has fur for warmth, lives in a den underground, eats creatures found in the habitat (frogs, worms, berries, mice)
3. Birds - breathe through lungs, have wings to fly to warmer places (migrate) or out of danger, eat worms and slugs found on the ground.

Know that animals and plants survive in a habitat because of each other and that different plants and animals live in different places because of their needs.  
Link to food chains for how they depend on each other to survive.

Know the terms omnivore, carnivore and herbivore to describe the eating habits of animals in the food chain.  
Know that the arrows on a food chain show the direction that the energy travels.

Recognise and name these larger habitats - ocean, tropical rainforest, desert, woodland, and polar ice.  
Know the names of plants in these habitats such as cactus, tumbleweed (desert), orchid, coffee plant (rainforest) dandelion, moss, clover, grass, shrub, conifer (woodland/grassland).

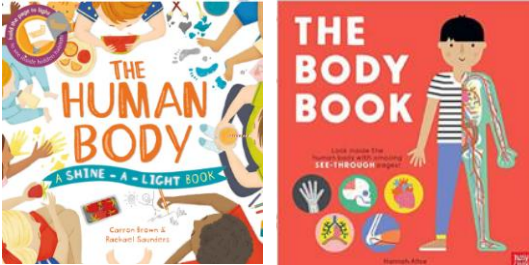
Know the names of the following minibeasts - caterpillar, spider, woodlouse, beetle, worm, slug, water boatman, pond skater and observe where they live.  
Know that an insect has 6 legs.  
Know that a spider has 8 legs and is an arachnid.  
Know that a worm and a slug are not insects.  
Understand the term microhabitat: a small habitat specific to minibeasts within larger habitats. A woodland has many microhabitats - under a log or rock, a leaf pile, under a bush or a pond.

Term:	Y2- Autumn 2	Key Text(s):	 
Scientist Study:	John Dunlop (1840-1921) Scottish inventor and veterinary surgeon who developed pneumatic rubber tyre for bicycles and cars.		
Unit Title:	<b>Chemistry: Uses of Everyday Materials</b>  <u><b>Context for study:</b></u> This unit is the second of five science units where pupils study materials as part of the discipline of chemistry. Pupils have a secure knowledge of the properties of a variety of everyday materials. Pupils can identify, name and describe an object in terms of the material it is made from including if it is 'man-made' or 'natural'. Previous learning includes comparing and grouping together everyday materials on the basis of their simple physical properties. This year 2 unit builds on pupils' knowledge of materials of properties as pupils identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses. New learning includes comparing how things move on different surfaces. This unit will help pupils understand how squashing, bending, twisting and stretching can change the shapes of some solid objects. This is the precursor to work studied in Year 3 rocks and soils. The knowledge acquired will help pupils in Year 4 as pupils study materials in terms of solid, liquid and gases. Year 5 pupils learn about dissolving, mixing and changes of state, and reversible and irreversible changes. Pupils also build on previous knowledge of magnetic and non-magnetic metals.  <b>Working Scientifically:</b> Record: What materials could be used to make a good raincoat?		
<b>Material:</b> What different objects/things are made from. <b>Properties:</b> What a material is like and how it behaves. Example: bending. <b>Squashing:</b> Pushing things closer together. <b>Bending / Flexible:</b> Can change shape and direction easily. <b>Twisting:</b> Moving one part of an object clockwise and the other anti-clockwise. <b>Stretching:</b> Change the shape of things by pulling them apart and making them longer or wider. <b>Hard:</b> Hard or difficult to squash. <b>Soft:</b> Easy to squash. <b>Rough:</b> A bumpy surface. <b>Smooth:</b> A flat surface.			



**Waterproof:** Does not let water go through it. The water droplets stay on top.

NC Objectives	Knowledge Content	Working Scientifically														
<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses</p> <p>Compare how things move on different surfaces.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p> <p>Working scientifically:</p> <p>Performing simple tests</p> <p>Observing closely, using simple equipment.</p> <p>Gathering and recording data to help in answering questions.</p>	<p>Know that matter (stuff) is made from tiny building blocks.</p> <p>Know the following properties of materials - flexible, stiff, rigid, stretchy, hard, soft, brittle, strong, weak, absorbent, heavy, light, solid, runny (viscosity - mentioned in making every science lesson count) smooth, rough, opaque, transparent and translucent.</p> <p>Know which materials have these properties (include plastic, wood, aluminium foil, copper, steel, iron, ceramic, glass, wool, cotton, silk, rubber).</p> <p>Know the following definitions:</p> <table><tr><td>flexible</td><td>An object or material that can be bent easily without breaking.</td></tr><tr><td>stiff</td><td>Something that is <b>stiff</b> is firm or does not bend easily</td></tr><tr><td>rigid</td><td>A <b>rigid</b> substance or object is stiff and does not bend, stretch, or twist easily.</td></tr><tr><td>opaque</td><td>If an object or substance is <b>opaque</b>, you cannot see through it.</td></tr><tr><td>transparent</td><td>If an object or substance is <b>transparent</b>, you can see through it.</td></tr><tr><td>translucent</td><td>If a material is <b>translucent</b>, some light can pass through it.</td></tr><tr><td>brittle</td><td>An object or substance that is <b>brittle</b> is hard but easily broken.</td></tr></table> <p>Use properties to compare what different materials would be used for and why.</p> <p>Know that a chair can be made of wood because wood is strong and rigid. Plastic would also be good for a chair because it is strong, flexible and smooth. Glass is a good material for a window because it is transparent and rigid. Fabric would be a good material for a jumper because it is flexible, soft and strong.</p> <p>Know why some materials are not appropriate e.g. Why is glass not appropriate for a chair? Why is wood not appropriate for a window?</p> <p>Know how to use a Venn diagram to sort a set of materials (e.g., one circle labelled ‘flexible’ and the other circle labelled ‘opaque’)</p> <p>Know that materials can change shape when properties are flexible and soft but they can’t change shape when the properties are rigid, hard and stiff.</p>	flexible	An object or material that can be bent easily without breaking.	stiff	Something that is <b>stiff</b> is firm or does not bend easily	rigid	A <b>rigid</b> substance or object is stiff and does not bend, stretch, or twist easily.	opaque	If an object or substance is <b>opaque</b> , you cannot see through it.	transparent	If an object or substance is <b>transparent</b> , you can see through it.	translucent	If a material is <b>translucent</b> , some light can pass through it.	brittle	An object or substance that is <b>brittle</b> is hard but easily broken.	<p>Make predictions and test how durable materials are.</p> <p>Make predictions and test items made from different materials against 4 forces: squashing, bending, twisting and stretching.</p> <p>Know that applying forces to objects can change their shape.</p> <p>Record the results to see which can be changed or not by each force.</p>
flexible	An object or material that can be bent easily without breaking.															
stiff	Something that is <b>stiff</b> is firm or does not bend easily															
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Term:	Y2- Spring	Key Text(s):	
Scientist Study:	N/A		
Unit Title:	<b>Biology: Animals including Humans</b>  <u>Context for study:</u> This unit is the second of eight science units where pupils study animals, including humans, as part of the discipline of biology. Pupils have a secure knowledge of common animals, their babies and their habitats. Pupils can identify and name a variety of common animals that are carnivores, herbivores and omnivores. Pupils can identify, name, draw and label the basic parts of the human body. In Year 2, pupils study life cycles and learn that animals, including humans, have offspring which grow into adults. New learning includes the basic needs of animals, including humans, for survival and the importance of exercise, eating the right amounts of different types of food, and hygiene. This unit is the precursor to work studied in lower key stage 2 where pupils learn to classify and group animals and learn about skeletons, vital organs and the digestive system. In Upper key stage 2 pupils continue their learning looking in more depth at food chains, life cycles, vital organs and the circulatory systems.  <b>Working Scientifically:</b> Enquire: Do all animals start off small?		
<b>Healthy:</b> Keeping healthy means doing things that are good for the body including sleeping, regular exercise and eating nutritious foods. <b>Diet:</b> The things that people eat and drink. A balanced diet included a mixture of foods which contain the correct nutrients needed to repair the body and grow. <b>Exercise:</b> Moving all parts of the body so that different muscles are made to work. This helps people to burn off fat and to improve breathing, getting oxygen from the air around the body faster. <b>Nutrients:</b> The things which the body needs to grow and repair itself. These include vitamins and minerals. <b>Hygiene:</b> Taking care of our bodies by cleaning them. This stops us becoming ill from germs and also stops us smelling. <b>Vegetables:</b> Parts of plants usually found underground. They are good sources of vitamins, minerals and sugars in the form of starch. Example: Carrot. <b>Fruit:</b> Usually sweet-tasting parts of a plant, which are formed from flowers and often contain seeds. They are good sources of energy and nutrients. <b>Carbohydrates:</b> Stored sugars (fructose, glucose lactose) which are found in vegetables such as potatoes and grains such as rice and wheat. <b>Meat:</b> The flesh from another animal that is eaten. <b>Dairy:</b> Food which is made using milk.			



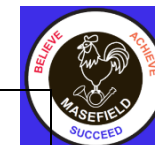


**Grow:** To get bigger.

**Sleep:** The body rests, grows and repairs itself when we are asleep, usually at night.

**Off-Spring:** A person or animal's children are their off-spring.

NC Objectives	Knowledge Content	Working Scientifically					
<p>Notice that animals, including humans, have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p> <p>Working scientifically:</p> <p>Observing closely, using simple equipment.</p> <p>Identifying and classifying.</p>	<p>Know the following animals and their babies and identify them in photos:</p> <table><tr><td><b>dog, puppy</b> <b>cat, kitten</b> <b>horse, foal</b> <b>bear, cub</b></td><td><b>bird, chick</b> <b>cow, calf</b> <b>pig, piglet</b> <b>goat, kid</b></td><td><b>duck, duckling</b> <b>lion, cub</b> <b>sheep, lamb</b> <b>snake, hatchling</b></td></tr></table>	<b>dog, puppy</b> <b>cat, kitten</b> <b>horse, foal</b> <b>bear, cub</b>	<b>bird, chick</b> <b>cow, calf</b> <b>pig, piglet</b> <b>goat, kid</b>	<b>duck, duckling</b> <b>lion, cub</b> <b>sheep, lamb</b> <b>snake, hatchling</b>	<p>Sorting animals into the correct classification</p> <p>Know that animals can be identified or sorted into groups based on their observable properties and their life cycles.</p> <p>Pupils will model the spread of germs using glitter.</p>		
	<b>dog, puppy</b> <b>cat, kitten</b> <b>horse, foal</b> <b>bear, cub</b>	<b>bird, chick</b> <b>cow, calf</b> <b>pig, piglet</b> <b>goat, kid</b>	<b>duck, duckling</b> <b>lion, cub</b> <b>sheep, lamb</b> <b>snake, hatchling</b>				
	<p>Know that animals grow and change over their lifetime.</p> <p>Know that animals grow in a womb, and are born or hatch.</p> <p>Know the following animals that hatch from eggs and those that have live young - (Watch video clip - <a href="https://www.bbc.com/bitesize/clips/zdw9wmn">https://www.bbc.com/bitesize/clips/zdw9wmn</a>)</p>						
	<table><tr><th>Hatch from an egg</th><th>Live young</th></tr><tr><td>Crocodile Swift Mosquitos Frogs Toads Crabs Moth Spiders</td><td>Horses Cats Dogs Lions Cows Sheep Pigs</td></tr></table>	Hatch from an egg	Live young	Crocodile Swift Mosquitos Frogs Toads Crabs Moth Spiders	Horses Cats Dogs Lions Cows Sheep Pigs		
	Hatch from an egg	Live young					
Crocodile Swift Mosquitos Frogs Toads Crabs Moth Spiders	Horses Cats Dogs Lions Cows Sheep Pigs						
<p>Know that most snakes lay eggs but some produce live young.</p> <p>Know that some animals need milk and care from their mothers (including lambs, calves, piglets, goat kids) and some fend for themselves (including ducks and geese).</p>							
<p>Know the life cycle of a human using the following language: Baby, Toddler, Child, Teenager, Adult, Elderly.</p> <p>Know the life cycle of a frog - frogspawn, tadpole, frog.</p>							



Know that the term metamorphosis describes the change from a tadpole to adult frog.  
Know that frogs have four legs - two front legs and two back legs. (address the misconception that frogs have arms)

### Health

Know that animals and humans need water, food and air to survive (relate to looking after pets)  
Know that humans need exercise to stay fit and healthy (exercise can include, running, swimming, playing sport etc.)  
Know that the heart pumps blood around the body through the veins and that lungs are used for breathing. The heart and lungs are called organs.  
Know that when we breathe in we take oxygen from the air.  
Know why we need a heart and why we need lungs.

### Diet

Know that a balanced diet consists of the five food groups below.  
Know examples from each and the health benefit of each food group

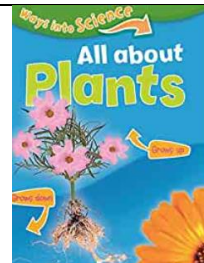

- Carbohydrates give us energy (e.g. bread, pasta, rice)
- Protein helps the body to grow and repair itself (e.g. meat, fish, eggs)
- Dairy products keep bones and teeth healthy (e.g. milk, yoghurt, cheese)
- Fruit and Vegetables keep your digestive system healthy. (e.g. apple, orange, pear, strawberry, melon)
- Fats and Sugars give us energy but should not be eaten too often (e.g. butter, cooking oil, cream, chocolate, sweets, jam, cakes, biscuits)

Know that we need to drink water to be hydrated and stay healthy.  
Know that water is good to drink as it does not contain calories and is not harmful to teeth.  
Know that calories are 'a measure of the amount of energy in food'.  
Know that sugary soft drinks can damage teeth and contain sugar which can be harmful to the body.

### Hygiene

Know that a germ is 'a very small living thing that causes disease'.  
Know that they are only visible through a microscope.  
Know the following basic hygiene rules to prevent the spread of germs  
Wash hands regularly especially before eating and after using the toilet  
Cover your mouth when sneezing or coughing  
Have a bath or shower regularly  
Brush teeth twice a day



Term:	Y2- Summer 1	Key Text(s):		
Scientist Study:	N/A			
Unit Title:	<b>Biology: Plants</b>  <u><b>Context for study:</b></u> This unit follows on from learning in Reception about the seasons and changes that happen to the plants during those seasons. They have also recognised some fruits and vegetables and named the basic parts of a plant. In year 1 the pupils learned about the names of common plants and trees and how to identify them by their leaves. They learn about the terms ‘evergreen’ and ‘deciduous’. In year 2 pupils will recap common plants and trees studied in year 1 before moving onto how plants grow (including germination and pollination), what they need to grow healthily and differences between bulbs and seeds. This unit includes an investigation about growing healthy plants. This is the precursor to work studied in Year looking more at what plants need to grow healthily. They will also study water transportation and the process of the life cycle of the plant including pollination, seed formation and seed dispersal. In Year 6, pupils continue to study plants by studying plant classification for flowering and not flowering plants.  <b>Working Scientifically:</b> Explore: Do plants grow the same amount every day?			
<b>Plant:</b> A living thing which uses energy from the Sun to make its own food (sugar). They grow from seeds and bulbs. <b>Roots:</b> The part of a plant found (mostly) underground. They hold (anchor) the plant in place and soak up (absorb) nutrients and water from the soil to help the plant grow. <b>Bulb:</b> These are underground masses of food storage from which plants grow. <b>Seeds:</b> Seeds are formed within the fruits of flowering plants. New plants grow (germinate) from these. <b>Blossom:</b> The mass of flowers created by a tree or plant. Blossom is usually found in Spring. <b>Stem:</b> The part of a plant which supports the leaves and flowers. Water and food are transported (moved around) inside the stem. <b>Trunk:</b> The trunk is the stem of a tree. It is thicker, woody and stronger, holding up the crown (branches) of the tree. <b>Leaves:</b> Mostly green parts of the plant used to capture sunlight to help the plant grow. <b>Woodland:</b> A woodland is a habitat where trees are the main (dominant) type of plant. <b>Deciduous:</b> These are trees which shed (drop) their leaves in the Autumn and grow new ones in Spring. Example: Oak. <b>Evergreen:</b> These trees and plants do not lose their leaves in Autumn, instead they keep them all year round. Example: Conifer.				

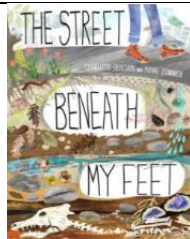
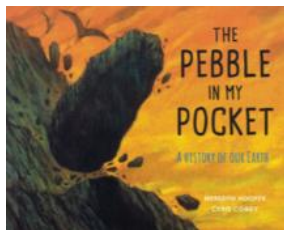


NC Objectives	Knowledge Content	Working Scientifically
<p><i>Observe and describe how seeds and bulbs grow into mature plants</i></p> <p><i>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</i></p> <p><i>Working scientifically:</i></p> <p><i>Performing simple tests</i></p> <p><i>Observing closely, using simple equipment.</i></p> <p><i>Gathering and recording data to help in answering questions.</i></p>	<p>Know the names of common trees and plants from Y1 curriculum Plants: daisy, white clover, poppy, nettle, ivy, bramble, dandelion and grass and introduce new species daffodils, roses, thistle and shamrock. Trees - oak, elm, maple, silver birch, sycamore, horse chestnut, crack willow. Know that roses are England's national flower, that thistles are Scotland's national flower, daffodils are Wales' national flower and shamrocks are Northern Ireland's national flower. Know how to use the term species to describe different plants.</p> <p>Know the parts of a plant as roots, stem, flower, leaves (revision from Y1) Know that roots support the plant in the ground and absorb water and nutrients needed for growth. Know that nutrients are substances that help plants and animals to grow. Know that the stem holds the flower and leaves up to the sunlight and carries water and nutrients to the leaves. Know that leaves are made to catch sunlight and change the sun's energy into energy for the plant to use to grow. They are the only living things that can do this. Know that the flower is where seeds are made. Know that bees and insects help this process by carrying pollen from one flower to another. This is called pollination.</p> <p>Know that plants grow from seeds or bulbs. Identify pictures of seeds and bulbs. Know that seeds are sown and bulbs are planted. Know that when a seed germinates it starts to grow. This process is called germination. As a plant grows it becomes a seedling before becoming an adult plant. Know that a shoot is a new part of a plant that grows. Know that seeds and bulbs have a store of food inside them.</p> <p>Understand why a circle diagram is used to understand the life cycle of a plant. Know that seeds need the following to germinate Water Oxygen Warmth</p> <p>Know that plants need the following to grow and be healthy: Water Air</p>	<p>Know that variables are the elements of an experiment that can be changed.</p> <p>Know how to conduct an experiment to demonstrate the effects of water and light on plant growth.</p> <ol style="list-style-type: none"> <li>1. Seed A should have water and access to light (this is called the Control)</li> <li>2. Seed B should have access to light but no water.</li> <li>3. Seed C should have no water and access to light.</li> <li>4. Seed D should have no water and no light.</li> </ol> <p>Pupils use what they know about what plants need to grow to predict what will happen for each container.</p> <p>Know that the experiment must have other variables the same e.g. temperature.</p> <p>Know that they must check the size of the plants regularly and over a long period of time.</p> <p>Know how to use a ruler to measure height of a plant in</p>



	<p>Warmth</p> <p>Light</p> <p>Nutrients ('food' absorbed by the roots)</p> <p>Know that healthy plants are green and strong unhealthy plants are often pale, yellowy and weak.</p>	<p>cm. Know how to describe the health of the plant through careful observation of colouring and stem strength.</p>
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Term:	Y3- Autumn 1	Key Text(s):	 
Scientist Study:	<b>Mary Anning</b> (1799-1847) English fossil collector and palaeontologist who showed fossils to be impressions of extinct creatures (usually dinosaurs). She found the first complete ichthyosaur skeleton.		
Unit Title:	<b>Chemistry: Rocks</b>  <b><u>Context for study:</u></b> This unit is the third of five science units where pupils study materials as part of the discipline of chemistry - the identification of the properties a substance is made from. It is also the study of forces as part of the discipline of physics – the study of the processes that shape our world and how we use it. Pupils have a secure knowledge of the properties of materials and can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses. Previous learning includes comparing how things move on different surfaces. Pupils know that squashing, bending, twisting and stretching can change the shapes of some solid objects. Pupils have studied the work of John Dunlop. This year 3 unit builds on pupils’ knowledge of properties of materials as pupils learn about rocks and soils. New learning includes comparing and grouping together different kinds of rocks on the basis of their appearance and simple physical properties. Pupils describe how fossils are formed when things that have lived are trapped within rock and recognise that soils are made from rocks and organic matter. The knowledge acquired of rocks and soils during this unit will help pupils understand the significance of the life and works of palaeontologist Mary Anning. Later in the year, during a separate Year 3 forces unit, pupils further develop their knowledge as they 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. This unit is the precursor to work studied in Year 4 as pupils study materials in terms of solids, liquids and gases. Year 5 pupils learn about dissolving, mixing and changes of state, and reversible and irreversible changes. Pupils also build on previous knowledge of magnetic and non-magnetic metals.  <b>Working Scientifically:</b> Enquire: Are all rocks made in the same way?		
<b>Rock/Stone:</b> A hard material formed out of minerals in the Earth’s crust. There are three types of rocks: sedimentary, igneous and metamorphic. <b>Layers:</b> A thickness of material which sits upon other materials beneath it. <b>Organic Matter:</b> Organic matter is matter that has come from a recently living organism. It is capable of decaying. <b>Permeable</b> (Absorbs Water): Allows water to soak into it. <b>Impermeable</b> (Waterproof): Water cannot soak into the material, instead, it simple runs off of the surface. <b>Soil:</b> Soil consists of a mix of organic material (decayed plants and animals) and broken bits of rocks and minerals.			



**Fossil:** A fossil is the preserved remains or traces of a dead organism.

**Sedimentary Rocks:** Sedimentary rocks are made when sand, mud and pebbles get laid down in layers. Igneous Rocks: Igneous rock is formed when magma cools and solidifies, it may do this above or below the Earth's surface.

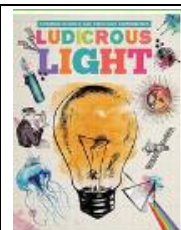
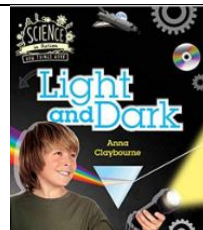
**Metamorphic Rocks:** When a rock experiences heat and pressure, it becomes a metamorphic rock. All metamorphic rocks start as another type of rock.

**Magma:** Hot, liquid rock found within the Earth's mantle. When magma comes to the surface of the crust, it is called lava.

NC Objectives	Knowledge Content	Working Scientifically
<p><i>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</i></p> <p><i>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</i></p> <p><i>Recognise that soils are made from rocks and organic matter.</i></p> <p><i>Working scientifically:</i></p> <p><i>Asking relevant questions and using different types of scientific enquiries to answer them.</i></p> <p><i>Setting up simple practical enquiries, comparative and fair tests.</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</i></p> <p><i>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</i></p>	<p>Know the three natural types of rocks: igneous, sedimentary and metamorphic.</p> <p>Know that the Earth has a solid crust made up of tectonic plates with molten rock beneath.</p> <p>Igneous rocks are formed from the heat of lava or magma. They have large crystals. e.g. Granite and basalt</p> <p>Sedimentary rocks are formed from sediment (small pieces of rock and earth that settle at the bottom of a liquid i.e. water) being compressed by the weight of the liquid above and cementing over time. They are made of small grains. e.g. Limestone (chalk), coal and sandstone.</p> <p>Metamorphic rocks are formerly igneous or sedimentary rocks that have been changed at a chemical level due to intense heat from magma. e.g. Marble and slate.</p> <p>Fossils</p> <p>Know that a fossil is the hard remains of a prehistoric animal or plant that are found inside a rock</p> <p>Know that fossils are comprised of body fossils (animal bones) and chemical fossils (that contain carbon and prove life once existed such as imprints in the ground and leave trace fossils behind) and understand how fossils are formed.</p> <p>Know that fossils are only found in sedimentary rock and go through the same process of compression and cementation in the ground over long periods of time.</p> <p>Know that it is very rare for living things to become fossilised. Usually after most animals die their bodies just rot away and nothing is left behind. However, under certain special conditions, a fossil can form.</p> <p>Know the sequence of fossil formation as:</p> <ol style="list-style-type: none"> <li>1. Animal dies and is buried by sediment</li> <li>2. Soft parts of the animal decay or decompose</li> <li>3. More sediment builds up around the animal and is compressed to form rock</li> <li>4. Bones start to be dissolved by water underground</li> <li>5. Minerals in the water then turn to rock</li> </ol>	<p>Know how to use a magnifying glass to identify features of the rock types. Identify if the rocks have grains or crystals.</p> <p>Know how to test a range of rocks for:</p> <p>Density (use comparative weight of similar sized rocks)</p> <p>Permeability/impermeability (waterproof - pour a small amount of water and observe it is absorbed or runs off)</p> <p>Strength (hard or soft - use a coin or similar object to scratch the rock and observe whether particles are easily dislodged).</p> <p>To decide which rock group the rock belongs to based on the properties.</p>



<p><i>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</i></p> <p><i>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</i></p> <p><i>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</i></p> <p><i>Identifying differences, similarities or changes related to simple scientific ideas and processes.</i></p> <p><i>Using straightforward scientific evidence to answer questions or to support their findings.</i></p>	<p><b>Mary Anning</b></p> <p>Know that Mary Anning is famous for finding many important fossils.</p> <p>Know that she was born in 1799 in Lyme Regis, Dorset which is near the coast.</p> <p>Know that 200 million years ago Dorset was beneath the sea.</p> <p>Know that her fossils helped us to understand more about prehistoric animals.</p> <p>Know the term palaeontology means ‘a person who studies fossils’</p> <p>Know the term dinosaur comes from the Greek word deinos (terrible) and sauros (lizard) which, put together, makes ‘terrible lizard.’</p> <p>Know that dinosaurs are actually reptiles not lizards.</p> <p>Learn about the discovery of the ichthyosaur skull and a complete plesiosaur and how this changed the view of the prehistoric (pre-written history) natural world.</p> <p>Know that previously people did not believe in dinosaurs as real, as there was no evidence. It also helped people realise the world was much older than previously thought.</p> <p>Video clips:  <a href="https://www.bbc.com/ideas/videos/the-girl-who-helped-discoverdinosaurs/p06bfr1s">https://www.bbc.com/ideas/videos/the-girl-who-helped-discoverdinosaurs/p06bfr1s</a>  <a href="https://www.bbc.co.uk/programmes/p015gn8">https://www.bbc.co.uk/programmes/p015gn8</a></p> <p><b>Soil</b></p> <p>Know that soil is a mixture of air, water, broken down rock matter and other organic material (dead or living animal tissue)</p> <p>Know the names of common soil types: sand, clay and silt.</p> <p>Know that sandy soil is dry and gritty, and does not hold onto water.</p> <p>Silty soil is richer in nutrients and smoother to the touch. It has smaller particles (a tiny piece of matter) and it can retain water for longer but will eventually start to lose this.</p> <p>Clay soil has the smallest particles and so absorbs more water. It is silky when wet but smooth and solid when dry. It contains the most nutrients as they cannot escape in water.</p> <p>Know that topsoil is dark in color and high in organic matter</p> <p>Know that subsoil usually appears to be lighter in colour and has a sticky texture</p> <p>Know that bedrock is the solid rock in the ground which supports all the soil above it.</p>	
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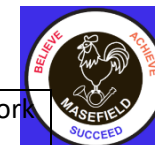
Term:	Y3- Autumn 2	Key Text(s):		
Scientist Study:	N/A			
Unit Title:	<b>Physics: Light</b>  <u><b>Context for study:</b></u> This unit is the first of two science units where pupils learn about light as part of the discipline of physics - the study of the processes that shape our world and how we use it. Pupils have a secure knowledge of the terms opaque, transparent and translucent. They know what plants need, including light, to grow well and how energy from light is the start of a food chain. This unit builds upon pupils’ prior knowledge of materials as they recognise that shadows are formed when an opaque object blocks the light from a light source. Pupils find patterns in the way that the size of shadows changes. In Year 3, pupils learn we need light in order to see things and that dark is the absence of light. New learning includes that light is reflected from surfaces and it can be separated into a prism of colours. Pupils learn that light from the sun can be dangerous and that there are ways to protect their eyes. This is the precursor to work studied in Year 6 as pupils learn how shadows are formed. The knowledge acquired in this unit will help pupils to understand how light travels in straight lines and how the amount of light entering the eye is controlled by the pupil.  <b>Working Scientifically:</b> Record: Why do shadows change during the day?			
<b>Light:</b> Visible radiation which travels in waves, originating from primary light sources and reflecting off of secondary sources. <b>Light Source:</b> The main light source for Earth is the Sun. Some other luminous objects give out light, for example, torches, candles and lamps. Primary sources create light; Secondary sources reflect it. <b>Dark / Darkness:</b> An absence of light. <b>Transparent:</b> A property of a material where all lights passes through. <b>Shiny Surface:</b> Reflects light. <b>Matt Surface:</b> Does not reflect light. It is dull. <b>Shadow:</b> A shadow is formed when an object blocks out the light. The object must be opaque or translucent to make a shadow. <b>Mirror:</b> Highly polished reflective surface (glass, metal or plastic) which allows a reflection to be clearly seen. <b>Sunlight:</b> Light created by the Sun (Our nearest star). <b>Dangerous:</b> Looking at direct sunlight can damage our eyes, possibly causing blindness.				
NC Objectives		Knowledge Content		Working Scientifically





<p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>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</p> <p>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.</p> <p><i>Working scientifically:</i></p> <p><i>Asking relevant questions and using different types of scientific enquiries to answer them.</i></p> <p><i>Setting up simple practical enquiries, comparative and fair tests.</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</i></p> <p><i>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</i></p> <p><i>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</i></p>	<p>Know that light is a form of energy</p> <p>Know that energy is needed to make things happen. Every movement or change, no matter how small, requires energy.</p> <p>Know that energy comes in different forms and can be neither created nor destroyed, only changed from one form to another.</p> <p>Know that we need light to see things and that darkness is the absence of light</p> <p>Know that light travels in straight lines Pupils should know that we require light to see and that darkness is the absence of light.</p> <p>Know that light is reflected from surfaces (smooth, shiny surfaces reflect light more efficiently), and is not the producer of the light source itself.</p> <p>Reflection of light is when we can see the light on another surface.</p> <p>Know that light reflects off objects and enters our eyes. This is how we see.</p> <p>Know that natural sources of light include - sun, stars, fire, lightning and bioluminescence in animals (such as fireflies)</p> <p>Know that there are man-made sources of light such as light bulbs, televisions, neon signs.</p> <p>Know that many light sources give off light and heat.</p> <p>Know that the Sun gives off light and heat</p> <p>Know that looking directly at the sun is dangerous, as the light is too strong.</p> <p>Understand that Ultraviolet (UV) light causes blindness or other long term vision problems and that eyes should be protected by covering with either a wide brimmed hat/cap or sunglasses.</p> <p>Know that a rainbow occurs when it is sunny and raining.</p> <p>Know that sometimes double rainbows can occur.</p> <p>Rainbows occur when the sun is low in the sky.</p> <p>Through teacher demonstration know that light can be separated with a prism into different colours.</p> <p>Know that white light consists of many different colours. These are - Red, Orange, Yellow, Green, Blue, Indigo, Violet. This is known as the spectrum of colours.</p> <p>This can be recalled with the mnemonic 'Richard of York Gave Battle In Vain'.</p> <p>Know that in a rainbow drops of rain act like a prism to create a rainbow.</p> <p>Understand that shadows are formed when an opaque object blocks light from passing through. This means it blocks out the light.</p> <p>Transparent and translucent objects let light through, creating no clear shadows.</p>	<p>Take part in an experiment to see how the distance of the light source away from an opaque object changes the length of the shadow.</p> <p>Use a man-made light source to create the light for the shadow.</p> <p>Know that the further away the light source, the smaller the shadow as less light is blocked.</p> <p>Know that the nearer the light source the larger the shadow as more light is blocked.</p> <p>Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same.</p> <p>Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight</p>
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*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.*


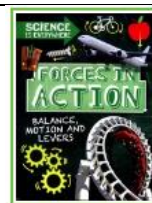
*Using straightforward scientific evidence to answer questions or to support their findings.*

Term	Definition	Example of material
Opaque	You cannot see through it	Wood, stone, metal
Translucent	Some light can pass through it but you cannot see clearly through it	some glass, some plastic, tissue paper
Transparent	You can see through it clearly	glass, plastic, cling film

on a plant – does this work with other plants / different types of light / etc).

Know that a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry.



Term:	Y3- Spring 1	Key Text(s):	 
Scientist Study:	N/A		
Unit Title:	<h2>Physics: Forces and Magnets</h2> <p><b><u>Context for study:</u></b> This unit is the first of three science units where pupils study forces as part of the discipline of physics - the study of the processes that shape our world and how we use it. There are also many links to the discipline of Chemistry - the identification of the properties a substance is made from. Pupils have a secure knowledge of resistance and friction, are able to compare how things move on different surfaces and know that applying forces to objects can change their shape. This Year 3 unit builds on pupils’ knowledge of how things move on different surfaces with a focus on the force friction. New learning is based on magnetism as pupils notice that some forces need contact between two objects, but magnetic forces can act at a distance. Pupils describe magnets as having two poles and observe how magnets attract or repel each other. Pupils further develop their knowledge of everyday materials as they compare and group according to whether they are attracted to a magnet, and identify some magnetic materials. The knowledge acquired in this unit will help pupils as they learn more about materials and their properties. This unit is the precursor to work in year 5 as pupils revise magnetism and learn about thermal and electrical conductivity.</p> <p><b><u>Working Scientifically:</u></b> Explore: Are all metals attracted to magnets?</p>		
<p><b>Forces:</b> Power or energy used to move something, usually by pushing or pulling. <b>Push:</b> An object is moved away from something. <b>Pull:</b> An object is moved towards something. <b>Contact Force:</b> A push or pull which touches the object being moved. <b>Non-Contact Force:</b> A push or pull which does not touch the object being moved. <b>Magnet:</b> An object that has the power to pull items made of iron towards it. These can come in different shapes: bar, ring, button and horseshoe. <b>Attract:</b> Pulls objects together. Opposite poles attract (North and South). <b>Repel:</b> Repulsion is a force what pushes objects away from one another. Similar poles repel (North-North and South-South). <b>Magnetic:</b> Objects which are attracted to a magnet are magnetic. They usually contain the metals iron, nickel or cobalt. <b>Magnetic Strength:</b> The pull strength of a magnet. <b>Pole:</b> The North and South poles are opposite ends of a magnet. The magnetic field flows from North to South. <b>Iron:</b> A common type of metal, which is magnetic. The Earth’s magnetic field is due to the core and mantel being made out of iron. <b>Surface:</b> The top layer of something.</p>			



**Friction:** A force acting between two surfaces moving, or trying to move, past each other.

NC Objectives	Knowledge Content	Working Scientifically
<p><i>Compare how things move on different surfaces</i></p> <p><i>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</i></p> <p><i>Observe how magnets attract or repel each other and attract some materials and not others</i></p> <p><i>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</i></p> <p><i>Describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing.</i></p> <p><i>Working scientifically: Asking relevant questions and using different types of scientific enquiries to answer them.</i></p> <p><i>Setting up simple practical enquiries, comparative and fair tests.</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</i></p>	<p>Know that a force can be thought of as a push or a pull.</p> <p>Know that there are three types of contact force: impact forces (when two surfaces collide), frictional forces (when two surfaces are already in contact) and strain forces (when an elastic material is stretched or squashed).</p> <p>Friction</p> <p>Know that the texture of a surface will affect how another object moves along that surface.</p> <p>Know that smooth surfaces allow things to move quickly but rougher surfaces create a pull that keeps the object stuck there longer.</p> <p>Know that the term motion means ‘moving from one place to another’</p> <p>Know that the force between two surfaces rubbing together is called friction.</p> <p>Know that a balanced force is when two forces are equal and there is no motion.</p> <p>Know that accelerate means to get faster.</p> <p>Know that decelerate means to slow down.</p> <p>Know that there are also non-contact forces that can act between objects without them touching and that magnetism is an example of a non-contact force.</p> <p>Magnetism</p> <p>Know that a magnet is a piece of iron or other material which attracts some metals towards it</p> <p>Know that a magnet has two poles - North and South</p> <p>Know that the word attract means one object pulling another object towards it</p> <p>Know that repel means one object pushing another object away from it</p> <p>Know that magnets have a magnetic field around them and that this is the area around a magnet where the magnetic forces work.</p> <p>Understand that magnetic forces can work at a distance and do not need to have contact.</p> <p>Know that when materials are drawn to magnets this is called attraction.</p> <p>Know that when materials are not drawn to magnets this is called repulsion.</p> <p>Know that magnets can come in different forms: horseshoe, ring, button, bar.</p> <p>Know the benefits of magnetic materials: sorting through different types of metals, keeping fridge doors sealed, attaching items to whiteboards without damaging them.</p>	<p>Plan an experiment comparing different materials, to see which are magnetic (they attract) and which are not (do not attract). Use wood, plastic, rubber, steel, iron, aluminium, glass and rock. Record results in a table.</p>



*Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.*

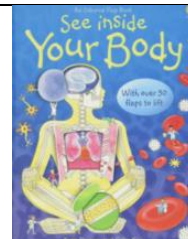
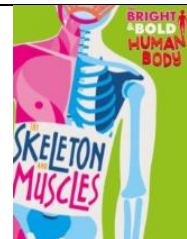
*Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.*

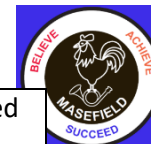
*Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.*

*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.*

Term:	Y3- Spring 2	Key Text(s):	 
Scientist Study:	N/A		
Unit Title:	<b>Biology: Animals including Humans</b>  <b><u>Context for study:</u></b> This unit is the fourth of eight science units where pupils study animals, including humans, as part of the discipline of biology - the study of living organisms. Pupils have a secure knowledge of life cycles and what animals, including humans, need to survive and the importance of a healthy lifestyle. Pupils can identify and name a variety of animals. Pupils know the names of animals native to the sea, rivers and canals and the features that help them to live there. Pupils can use classification keys to help group, identify and name a variety of living things in their local and wider environment. In this Year 3 unit, pupils learn 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. Pupils further develop their knowledge of what humans need to thrive by learning about a balanced diet, including how sugar can cause tooth decay and obesity, the food groups and their role in human development. New learning includes how humans and some other animals have skeletons and muscles for support, protection and movement. This unit is the precursor to work in year 4 as pupils learn about the digestive system, teeth and food chains. The knowledge acquired in this unit will help pupils in Year 5 as they learn about puberty and gestation periods of animals before studying the circulatory system and dental structures in year 6.  <b><u>Working Scientifically:</u></b> Enquire: How does our body move and stand up?		
<b>Nutrition:</b> Nutrition involves drinking enough water and eating the right amount of items from the four main food groups. <b>Carbohydrates:</b> Linked sugars which provide slow release of energy to the body. <b>Sugars:</b> The main source of energy used by all living things. <b>Protein:</b> Molecules which the body uses to create new tissues. <b>Vitamins:</b> Essential molecules needed by the body in order to stay healthy. <b>Minerals:</b> Naturally occurring chemicals which are needed to keep the body healthy and working. <b>Fibre:</b> Plant-based cellulose which helps aid human digestion. <b>Fat:</b> A major type of food store within bodies. Found in dairy products. <b>Skeleton:</b> The human skeleton is made of bone and grows as we grow. Our skull protects our brain and our ribs protect our heart and lungs. <b>Bones:</b> Hard, rigid parts of the body used to support the body and work with muscles to provide movement and protection for vital organs.			



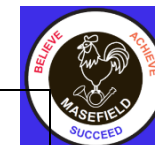
**Muscles:** Muscles are attached to bones by tendons and help them to move. When a muscle contracts it gets shorter and pulls on the bone it is attached to.

**Skulls:** The main bone found in the heads of animals. The skulls contains and protects the brain.

**Ribs:** Curved bones which form the rib cage. The rib cage is found in the chest area. It protects a person's internal organs from damage.

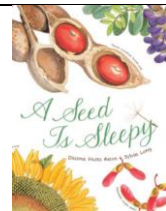
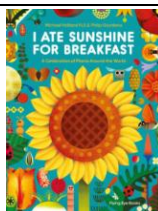
**Spine:** Also known as your backbone, your spine is a strong, flexible column of ring-like bones that runs from your skull to your pelvis.

NC Objectives	Knowledge Content	Working Scientifically												
<p><i>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.</i></p> <p><i>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</i></p> <p><i>Working scientifically: Asking relevant questions and using different types of scientific enquiries to answer them.</i></p> <p><i>Setting up simple practical enquiries, comparative and fair tests.</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</i></p> <p><i>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</i></p> <p><i>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</i></p>	<p>Animals, including humans, need food, water and air to survive.</p> <p>The arrows on a food chain show the direction that the energy travels.</p> <p>Know that all animals are consumers (they eat food but cannot create it themselves) and rely on a balanced diet to maintain their health.</p> <p>Consumers eat plants and some also eat other consumers.</p> <p>Know that plants are the only organisms that can make food for themselves using the sun's energy.</p> <p>The food that animals eat gives them nutrients for body health and maintenance.</p> <p>Know that nutrients are substances that help plants and animals to grow.</p> <p>Know that different food types provide different benefits for humans.</p> <p>Fruit and vegetables provide fibre, vitamins and minerals to keep body parts working properly and maintain health.</p> <p>Know that fibre consists of the parts of plants or seeds that your body cannot digest. Fibre is useful because it makes food pass quickly through your body.</p> <p>Know that vitamins are substances that you need in order to remain healthy which are found in foods.</p> <p>Know that vitamins are known by letters and know the following information about vitamins</p> <table border="1"> <thead> <tr> <th>Vitamin</th><th>Food</th><th>Main Role</th></tr> </thead> <tbody> <tr> <td>A</td><td>Milk, Cheese, butter</td><td>Healthy vision and skin</td></tr> <tr> <td>C</td><td>Orange, Lemon, tomatoes</td><td>Prevent infection</td></tr> <tr> <td>D</td><td>Milk, Cheese, Fish</td><td>Helps bone development</td></tr> </tbody> </table>	Vitamin	Food	Main Role	A	Milk, Cheese, butter	Healthy vision and skin	C	Orange, Lemon, tomatoes	Prevent infection	D	Milk, Cheese, Fish	Helps bone development	<p>Compare human skeletons with the skeletons of fish (tuna and shark), birds (owl and pigeon) and other mammals (blue whale, tiger, kangaroo).</p>
Vitamin	Food	Main Role												
A	Milk, Cheese, butter	Healthy vision and skin												
C	Orange, Lemon, tomatoes	Prevent infection												
D	Milk, Cheese, Fish	Helps bone development												



<p><i>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</i></p> <p><i>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</i></p> <p><i>Identifying differences, similarities or changes related to simple scientific ideas and processes.</i></p> <p><i>Using straightforward scientific evidence to answer questions or to support their findings.</i></p>	<p>Meat, fish and eggs provide protein, which is needed for healthy muscle development and maintenance.</p> <p>Milk, cheese and yoghurt provide calcium, necessary for good bone and tooth development.</p> <p>Know that fibre/vitamin rich food should be 50% of each meal, protein around 30% and calcium around 20%.</p> <p>Know that high fat and sugary food does not provide any nutritional value, and can be harmful to health.</p> <p>Know that tooth decay is caused by an excess of sugar.</p> <p>Know that mammals have skeletons and that a human is a type of mammal.</p> <p>Know what a human skeleton looks like.</p> <p>Name key parts e.g. skull/cranium, rib cage, spine, pelvis, collar bone, spine, vertebra, patella/knee cap, cartilage.</p> <p>Know that birds, fish, amphibians and reptiles also have skeletons, and that skeletons are designed to keep bodies the correct shape and help movement, as well as offer protection of organs, such as the skull protects the brain and the rib cage protects the heart in humans.</p> <p>Bird bones are hollow, making them lighter, enabling birds to fly.</p> <p>Know that humans have muscles.</p> <p>Know the name and location of the following skeletal muscles in the body - abdominal, pectoral, bicep, tricep, hamstrings, calves.</p> <p>Know that the heart is a special type of muscle called cardiac muscle.</p> <p>Know that muscles are attached to the bones, and are responsible for movement.</p> <p>Know that when muscles contract and relaxing, that this is what causes movement.</p> <p>Know that joints occur where two bones meet and are able to move together e.g. knee, elbow.</p>	
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Term:	Y3- Summer 1	Key Text(s):	 
Scientist Study:	N/A		
Unit Title:	<b>Biology: Plants</b>  <u><b>Context for study:</b></u> This unit is the third of six science units where pupils learn about plants as part of the discipline of biology - the study of living organisms. Pupils are able to identify and name a variety of common wild and garden plants including deciduous and evergreen trees. Pupils are also able to identify and describe the basic structure of a variety of common flowering plants, including trees. During this unit, pupils revise a significant amount of knowledge from Year 2: the parts of a plant/tree; the function of each part of a plant; what seeds and plants need to grow and be healthy. This unit also reviews and builds upon pupils’ knowledge of germination, pollination and life cycle diagrams. New learning includes seed formation and the four methods of seed dispersal. Pupils investigate the way in which water is transported within plants. The knowledge acquired in this unit will help pupils to group and classify living things in Year 4. This is the precursor to work studied in Year 5 when pupils construct food chains and in Year 6 when pupils study Linnaean classification, adaptations and sexual reproduction in plants.  <b>Working Scientifically:</b> Explain: Do all plants need exactly the same things?		
<b>Leaves:</b> Usually flat, green parts of a plant whose role is to capture sunlight in make sugar via photosynthesis. <b>Photosynthesis:</b> The process of making sugar using water, carbon dioxide and energy from sunlight. <b>Deciduous:</b> These are trees which shed (drop) their leaves in the Autumn and grow new ones in Spring. Example: Oak. <b>Evergreen:</b> These trees and plants do not lose their leaves in Autumn, instead they keep them all year round. Example: Conifer. <b>Seed:</b> Flowering plants produce seeds within fruits. The seed germinates, forming a root and shoot, growing into an adult plant. <b>Seedling:</b> A young, newly germinated plant from a seed, usually having a root, shoot and leaf. <b>Seasonal Change:</b> Changes to plant growth due to differences in the weather and temperature. <b>Roots:</b> The part of a plant which is found predominantly underground. Roots anchor the plant and absorb water and nutrients needed by the plant. <b>Pollen:</b> Fine grains from the male parts of flowers which fertilise eggs to create seeds. <b>Pollination:</b> The process where pollen from one plant is placed onto the female parts (stigma) of another plant. <b>Seed Formation:</b> The creation / growth of seeds from pollen and the eggs within flowers. <b>Seed Dispersal:</b> The ways in which seeds are scattered away from parent plants so that they are not in direct competition for resources. <b>Germination:</b> The growth of a root and shoot from a planted seed to form a seedling.			





**Flowers:** The bright, colourful parts of a plant consisting of petals and the male and female parts of a plant. They produce nectar (a sugary liquid) to attract insects to help in pollination.

NC Objectives	Knowledge Content	Working Scientifically
<p><i>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</i></p> <p><i>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.</i></p> <p><i>Investigate the way in which water is transported within plants</i></p> <p><i>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</i></p> <p><i>Working scientifically: Asking relevant questions and using different types of scientific enquiries to answer them.</i></p> <p><i>Setting up simple practical enquiries, comparative and fair tests.</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</i></p> <p><i>Gathering, recording, classifying and presenting data in a variety of</i></p>	<p>Know the following parts of a plant/tree (revision from Y2 unit) roots, stem, trunk, leaves and flower.</p> <p>Know the function of each part of a plant (revision from Year 2).</p> <p>Roots keep the plant secured within the ground and also collect water and nutrients from the soil. The stem keeps the plant upright and transports water to the leaves and flower head. The leaves collect energy from the sun to make into food. Plants are producers, as they make their food.</p> <p>Know that flowering plants are any plant that produces a flower head or fruit.</p> <p>Pollination, Seed formation and seed dispersal</p> <p>The flower is used to form seeds and attract animals for pollination.</p> <p>Insects such as bees travel from flower-to-flower drinking nectar for energy.</p> <p>Know that nectar is a sweet liquid produced by flowers, which bees and other insects collect. They collect pollen from one flower which sticks to their bodies. The grains of pollen from one plant stick to another plant and this begins the process of seed making. This is called pollination.</p> <p>After pollination over a number of days, seeds begin to form in the flower head. When the seeds are developed, they are scattered away from the parent plant through a process called seed dispersal.</p> <p>Know the importance of brightly coloured petals and flower heads as these colours can be seen by insects as 'advertisements' for food</p> <p>Know the four methods of seed dispersal:</p>	<p>Know that water travels through the stem of the plant.</p> <p>Use celery and coloured water to demonstrate the early stages of transpiration (water travelling through the plant.) Celery plants are mostly stems (as this is what we eat.)</p> <p>Set up the celery 72 hours prior to the session. Trim the root off the pieces, and place in dyed water. Red food colouring works better. Leave to allow the plant to soak up the dye.</p> <p>Cut open the celery and show a cross section of the plant. Draw the cross section of the celery.</p> <p>Know that a cross section is what you see if you cut through an object.</p>



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.

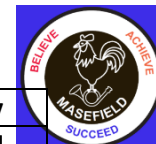
Using straightforward scientific evidence to answer questions or to support their findings.

Method	Description	Examples of seeds
Wind Dispersal	seeds are blown to a new location	sycamore, dandelion
Water Dispersal	seeds float on water to a new location	coconut
Animal Dispersal	animals carry seeds either on their skin or in their stomachs after eating to a new location	blackberry, cherry, burdock
Explosion	dry seed pods crack open and the seeds fly out to a new location	poppy, laburnum

Identify a cactus, tulip and venus fly trap in photographs  
Know how a cactus plant is different from a tulip. Cactuses have thicker stems as they live in arid (dry) conditions whereas tulips grow in damp conditions where access to water is much easier. Cactus plants do not rely on insects for reproduction, whereas tulips have bright leaves to attract insects.

Know the life cycle of a plant as follows - Germination > Growth > Pollination > Seed Formation > Seed Dispersal > Germination...

Term:	Y4- Autumn 1	Key Text(s):		
Scientist Study:	N/A			
Unit Title:	<b>Physics: Sound</b>  <b><u>Context for study:</u></b> This is a stand-alone unit where pupils learn about sound as part of the discipline of physics - the study of the processes that shape our world and how we use it. It is important to assume that all pupils have very little prior knowledge in this unit. During teaching, extra attention must be given to explicitly teaching the precise meaning of subject specific vocabulary as pupils may be unfamiliar with this. This unit does not link directly with any future science teaching so it is important that knowledge is secured during the unit. In Year 4, pupils identify how sounds are made and recognise that vibrations from sounds travel through a medium to the ear. Learning includes the anatomy of the ear and how whales communicate via Whale Song. The knowledge of sound acquired in this unit will help pupils find patterns between the pitch of a sound and features of the object that produced it. It also helps pupils find patterns between the volume of a sound and the strength of the vibrations that produced it. Pupils will know that sounds get fainter as the distance from the sound source increases.  <b>Working Scientifically:</b> Enquire: How do instruments make different sounds?			
<b>Sound:</b> Noise created from the vibrations of mediums such as air and water. <b>Source:</b> The place where the sound wave is first created. <b>Vibrate / Vibration:</b> Vibrations backwards and forwards movements caused when a medium such as air wobbles in the form of sound waves. <b>Pitch (High / Low):</b> A high sound has a high pitch and a low sound has a low pitch. A tight drum skin gives a higher pitched sound than a loose drum skin. <b>Volume:</b> How loud or quiet something is. <b>Faint:</b> Very low volume sounds that are difficult to detect. <b>Loud:</b> Very noisy sounds that are easy to detect. <b>Insulation:</b> Protecting something by surrounding it with material that reduces or prevents the transmission of sound. <b>Ear:</b> An organ of the body designed to detect sound waves. <b>Sound Wave:</b> The continuous vibrations of a medium moving away from the source. <b>Frequency:</b> Frequency is measured as the number of wave cycles that occur in one second. More waves means a higher frequency. This is linked to pitch.				

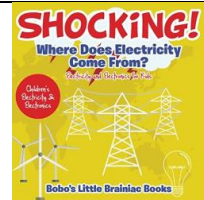
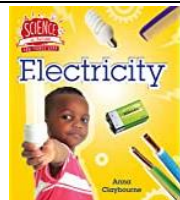


NC Objectives	Knowledge Content	Working Scientifically				
<p>Identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>Working scientifically:</p> <p>. Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Setting up simple practical enquiries, comparative and fair tests.</p> <p>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>Know sounds are made when something vibrates.</p> <p>Know that vibrate means to shake with repeated small quick movements.</p> <p>Metal vibrates when it is struck, vocal chords inside our throat vibrate when we speak. This causes the air around the source of the sound to vibrate. The vibration travels through the air to our ear in a wave. Sound waves can travel through solids (such as metal, stone and wood), liquids (such as water) and gases (such as air).</p> <p>Know that sound travels in longitudinal waves as each particle pushes the particles next to it.</p> <p>Know that where there is no gas, there is no sound. Sound cannot travel through space as there is no air. This is called a vacuum.</p> <p>Anatomy of the ear</p> <p>Know the structure/ anatomy of the human ear.</p> <p>Know that the ear consists of the outer ear and inner ear.</p> <p>Know that the eardrum is a thin piece of stretched skin inside the ear which vibrates. These vibrations then travel through a sequence of small bones (the smallest bones in the human body).</p> <p>These bones connect to the cochlea.</p> <p>The cochlea looks like a snail shell (the word ‘cochlea’ means snail in Ancient Greek).</p> <p>Small hairs in the cochlea convert the vibrations into nerve impulses which send information to the brain for processing.</p> <p>Pitch</p> <p>Know that pitch is how high or low a sound is.</p> <p>Know that the following words would be used to describe low and high pitch sound.</p> <table><tr><td>Low Pitch</td><td>squeak, squeal,</td></tr><tr><td>High Pitch</td><td>rumble, grunt, boom</td></tr></table> <p>Know that pitch and volume are different - volume is how loud or quiet a sound is.</p> <p>Know that there are high pitches and low pitches.</p> <p>A short string gives a higher-pitched sound than a long string when they are plucked.</p> <p>A tight drum skin gives a higher-pitched sound than a loose drum skin.</p> <p>Volume</p> <p>Know that the volume of a sound is how loud or quiet a sound is.</p>	Low Pitch	squeak, squeal,	High Pitch	rumble, grunt, boom	<p>Demonstrate that sound can travel through gas and liquid.</p> <p>Scratch a desk and listen to the sound through the air and then place your ear on the desk and listen again.</p> <p>Know that the sound is louder when it travels through the desk.</p>
Low Pitch	squeak, squeal,					
High Pitch	rumble, grunt, boom					



<p><i>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</i></p> <p><i>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</i></p> <p><i>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</i></p> <p><i>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</i></p> <p><i>Identifying differences, similarities or changes related to simple scientific ideas and processes.</i></p> <p><i>Using straightforward scientific evidence to answer questions or to support their findings.</i></p>	<p>Know that the stronger the vibrations the louder the sound.</p> <p>The weaker the vibrations the quieter the sound. Know that as sounds travel the vibrations become weaker, because they run out of energy.</p> <p>This means that the volume of the sound will decrease the further away a sound is from an ear to hear it.</p>	
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Term:	Y4- Autumn 2	Key Text(s):	 
Scientist Study:	N/A		
Unit Title:	<b>Physics: Electricity</b>  <u><b>Context for study:</b></u> This unit is the first of two science units where pupils learn about electricity as part of the discipline of physics - the study of the processes that shape our world and how we use it. Children will have limited prior knowledge before studying this unit. During this Year 4 unit, pupils identify common appliances that run on electricity and construct a simple series electrical circuit, identifying and naming its basic parts. Pupils investigate 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. Pupils recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. They recognise some common conductors and insulators, and associate metals with being good conductors. The knowledge acquired in this unit will help pupils to compare and group together everyday materials on the basis of their properties, in terms of conductivity, in Year 5. This is the precursor to work studied in Year 6 when pupils use recognised symbols when representing a simple circuit in a diagram. Pupils investigate the brightness of lamps or the volume of buzzers with the number and voltage of cells used in the circuit. Pupils compare and give reasons for variations in how components function.  <u><b>Working Scientifically:</b></u> Explain: Does Electricity flow easily through all objects?		
<b>Electricity:</b> The flow of electrons through conducting materials such as metal. <b>Electrical Appliance:</b> A machine which is powered by electricity. <b>Mains:</b> The electricity source from sockets within homes. This supply is more powerful than batteries and is generated by power stations. <b>Electrical Circuit:</b> A device linked to a cell (battery) by wires in a closed / complete circuit. It must be complete, with no breaks or gaps in connections. <b>Cell / Battery:</b> A device that is used to generate electricity, or one that is used to make chemical reactions possible by applying electricity. <b>Positive / Negative:</b> The two, oppositely charged ends of a cell (battery). <b>Short Circuit:</b> A wire linked to a cell / battery with no appliances to power. This is dangerous, generating heat and drains batteries of their charge. <b>Crocodile Clip:</b> A metal, toothed clip used to join wires to electrical components. <b>Bulb:</b> An electrical device designed to create light. <b>Switch:</b> A device which allows the controlled breaking and completion of circuits in order to turn things on/off. <b>Buzzer:</b> An electrical device which makes a buzzing sound. <b>Electrical Conductor:</b> Some materials let electricity pass through them easily. These materials (mostly metals) are known as electrical conductors. <b>Electrical Insulator:</b> Some materials stop electricity passing through them.			

## Electrical Symbol: Standardised ways of drawing electrical components.

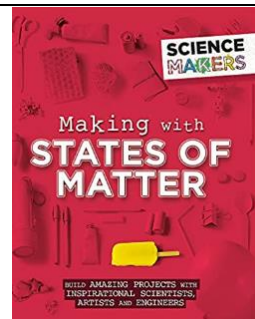
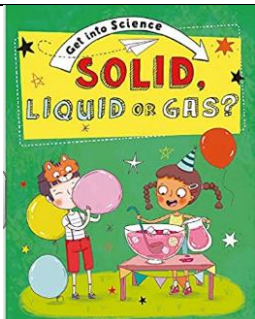
NC Objectives	Knowledge Content	Working Scientifically
<p><i>Identify common appliances that run on electricity.</i></p> <p><i>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</i></p> <p><i>Identify whether or not 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.</i></p> <p><i>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</i></p> <p><i>recognise some common conductors and insulators, and associate metals with being good conductors</i></p> <p><i>Working scientifically:</i> <i>Asking relevant questions and using different types of scientific enquiries to answer them.</i></p> <p><i>Setting up simple practical enquiries, comparative and fair tests.</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</i></p>	<p>Know that electricity is dangerous, and know how to be safe using it.</p> <p>Know how electricity travels through a circuit, and the various components that create a circuit (Battery, cell, open and closed switches, buzzer, lamp, motor, wire and voltmeter.)</p> <p>Note: all batteries are cells, but not all cells are batteries.</p> <p>A cell is a power source, a battery is a power source that uses chemical reactions to generate power.</p> <p>Know the correct symbols to use when drawing circuits.</p> <div data-bbox="824 603 1400 949" data-label="Diagram"> </div> <p>Know appliances that run on electricity in school and at home and those that do not.</p> <p>Identify the hazards that might be faced in the home.</p> <ol style="list-style-type: none"> <li>1. Overloaded plug extension sockets,</li> <li>2. Exposed wires,</li> <li>3. Damaged sockets,</li> <li>4. Wires left along the carpet for people to trip over,</li> <li>5. Electrical appliances and wires near water,</li> <li>6. Placing metal into electrical appliances or open sockets</li> </ol> <p>Know how to prevent these hazards and know not to touch anything they feel is unsafe.</p> <p>Know how to create simple circuits using a battery, a bulb and a switch.</p> <p>Know that an open switch will not complete the circuit and that a closed switch will complete the circuit.</p> <p>Know that electricity must be able to flow around the circuit for components to work.</p>	<p>Know that conductors allow electricity to pass through them and that insulators prevent the passage of electricity.</p> <p>Know that metals such as copper, iron and steel make good conductors. Know that wood, plastic, paper and rubber are insulators.</p> <p>Identify materials that are conductors and insulators. (Children should know which materials are insulators and conductors prior to the investigation.</p> <p>Plan an investigation to check the conductive properties of materials, with pupils predicting that metals will allow a circuit to be complete, but that other materials will not.</p> <p>Test the predictions and record in a table.</p>



<p><i>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</i></p> <p><i>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</i></p> <p><i>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</i></p> <p><i>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</i></p> <p><i>Identifying differences, similarities or changes related to simple scientific ideas and processes.</i></p> <p><i>Using straightforward scientific evidence to answer questions or to support their findings.</i></p>	<p>Know the difference between mains electricity and battery powered electricity.</p> <p>Know that the word current describes the flow of electricity in a circuit.</p> <p>Know that static electricity can be created by rubbing a balloon on material or through brushing hair</p> <p>Know if the following circuits work or not.</p> <ol style="list-style-type: none"><li>1. A complete circuit without switches.</li><li>2. A circuit with wires not connected to the cell on one side.</li><li>3. A complete circuit with an open switch.</li><li>4. A complete circuit with a closed switch.</li><li>5. A circuit where the wire is not connected to the bulb / buzzer / motor.</li></ol>	
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Term:	Y4- Spring 1	Key Text(s):		
Scientist Study:	N/A			
Unit Title:	<b>Chemistry: States of Matter</b>  <u>Context for study:</u> This unit is the fourth of five science units where pupils study materials as part of the discipline of chemistry - the identification of the properties a substance is made from. It is also the study of forces as part of the discipline of physics – the study of the processes that shape our world and how we use it. Pupils have a secure knowledge of the properties of materials and can identify and compare the suitability of a variety of everyday materials. Previous learning includes comparing how things move on different surfaces and pupils know that squashing, bending, twisting and stretching can change the shapes of some solid objects. Pupils have studied the work of John Dunlop and Mary Anning. Pupils can compare and group different kinds of rocks on the basis of their appearance and simple physical properties. Pupils know how fossils are formed and recognise that soils are made from rocks and organic matter. This year 4 unit builds on pupils’ knowledge of properties of materials as pupils learn about states of matter. Pupils compare and group materials together, according to whether they are solids, liquids or gases. New learning includes 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). Pupils. The knowledge acquired during this unit will help pupils understand the water cycle in geography: the part played by evaporation and associate the rate of evaporation with temperature. This unit is the precursor to work studied in Year 5 pupils learn about dissolving, mixing and changes of state, and reversible and irreversible changes. Pupils also build on previous knowledge of magnetic and non-magnetic metals.  <b>Working Scientifically:</b> Explore: Does water always melt at the same speed?			
<b>Solid:</b> A substance that stays the same shape. Its particles do not move <b>Liquid:</b> Liquids will flow, it is made up of loosely packed particles. <b>Gas:</b> Gaseous matter is made up of matter that is so loose that it is always moving. <b>State Change:</b> Materials changing between solids, liquids and gases through freezing, melting, evaporation and condensation. <b>Melting:</b> Change in state from solid to liquid. <b>Freezing:</b> Change in state from liquid to solid.				



**Melting Point:** The temperature where a material begins to melt.

**Boiling Point:** The temperature where a liquid begins to turn into a gas (vapour).

**Evaporation:** Change in state from liquid into gas.

**Condensation:** When water vapour that is around us changes from a gas back to water.

**Temperature:** The amount of heat in a substance or object.

**Water Cycle:** The continuous cycle of evaporation, condensation and precipitation of water around the world.

**Water Vapour:** Water that is in the form of gas.

**Precipitation:** Any watery substance such as rain, water, snow, hail or sleet that falls to Earth.


**Surface Run-Off:** Surface water which travels across the land, flowing into streams and rivers.

NC Objectives	Knowledge Content	Working Scientifically						
<p><i>Compare and group materials together, according to whether they are solids, liquids or gases.</i></p> <p><i>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)</i></p> <p><i>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</i></p> <p><i>Working scientifically:</i></p> <p><i>Asking relevant questions and using different types of scientific enquiries to answer them.</i></p> <p><i>Setting up simple practical enquiries, comparative and fair tests.</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment,</i></p>	<p>Know that everything is made up of tiny particles.</p> <p>The properties of a substance depend on what its particles are like, how they move, and how they are arranged.</p> <p>Most substances can exist in three states: solid, liquid and gas.</p> <p>In a solid state the vibrating particles form a regular pattern. This explains the fixed shape of a solid and why it can't be compressed or poured.</p> <p>In a liquid the particles still touch their neighbours but they move around, sliding over each other. This is why you can pour, but not compress (squash), a liquid.</p> <p>In the gas state, widely-spaced particles move around randomly. This explains why you can compress gases and why they flow.</p> <p>Identify the following solids, liquids and gases at room temperature. Know that room temperature means neither heated nor cooled. Watch video clip at:  <a href="http://www.bbc.co.uk/guides/zqpv7p3#zh4fy4j">http://www.bbc.co.uk/guides/zqpv7p3#zh4fy4j</a></p> <table border="1"> <thead> <tr> <th>Solid (at room temperature)</th><th>Liquid (at room temperature)</th><th>Gas (at room temperature)</th></tr> </thead> <tbody> <tr> <td>Wood Iron Copper Plastic</td><td>water milk blood oil</td><td>oxygen carbon dioxide nitrogen steam</td></tr> </tbody> </table> <p>Know that air is a collection of gases (not a single gas) and it contains - 78% nitrogen, 21% oxygen and a small amount of other gases including carbon dioxide.</p>	Solid (at room temperature)	Liquid (at room temperature)	Gas (at room temperature)	Wood Iron Copper Plastic	water milk blood oil	oxygen carbon dioxide nitrogen steam	<p>Demonstration of different foods melting. Observe and record how long butter, chocolate and whipped cream take to melt.</p> <p>Measure the temperatures as the solids are heated using a thermometer.</p>
Solid (at room temperature)	Liquid (at room temperature)	Gas (at room temperature)						
Wood Iron Copper Plastic	water milk blood oil	oxygen carbon dioxide nitrogen steam						



<p><i>including thermometers and data loggers.</i></p> <p><i>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</i></p> <p><i>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</i></p> <p><i>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</i></p> <p><i>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</i></p> <p><i>Identifying differences, similarities or changes related to simple scientific ideas and processes.</i></p> <p><i>Using straightforward scientific evidence to answer questions or to support their findings.</i></p>	<p>Know that steam and smoke are not the same thing.</p> <p>Know that steam is water in gas form and that smoke comes from burning solid material.</p> <p>Know that when atoms are heated, the bonds between them break, allowing for solids to become liquids, and liquids to become gases.</p> <p>Know that when materials are cooled, bonds are created in air to form liquids, and bonds are strengthened and become rigid, creating solids from liquids.</p> <p>Know that we measure temperature using degrees Celsius (<math>^{\circ}\text{C}</math>)</p> <p>Know that in many countries they use a Fahrenheit scale.</p> <p>Compare the two scales.</p> <p>Know that condensation is the name of the process when water vapour changes into liquid through cooling.</p> <p>Know that condensation also refers to the liquid as it appears on windows on a cold day.</p> <p>Know that as water condenses clouds form in the sky.</p> <p>When it is cool enough, and a vast amount of water has formed, it falls in the form of rain and is called precipitation.</p> <p>Know that water can exist in all three states. (use the word water vapour alongside steam).</p> <p>Understand that water will change from a liquid to a solid when cooled to <math>0^{\circ}\text{C}</math> and that this is the freezing process. When ice melts, it becomes liquid which becomes part of the water cycle again.</p>	
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Term:	Y4- Spring 2	Key Text(s):	 
Scientist Study:	<b>David Attenborough</b> (1926-Present) English broadcaster and natural historian, known for his work within the BBC’s Natural History Unit, fronting productions such as Planet Earth II and Blue Planet II.		
Unit Title:	<b>Biology: Living Things and their Habitats</b>  <u><b>Context for study:</b></u> This unit is the fourth of six science units where pupils learn about plants and animals as part of the discipline of biology- the study of living organisms. Pupils have a secure knowledge of the functions of the different parts of flowering plants and the requirements of plants for life and growth. They know how water is transported within plants and the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. This Year 4 unit builds upon pupils’ prior knowledge of plants as they identify and name a variety of living things in their local and wider environment. Pupils group living things and begin to use classification keys for flowers (flowering and nonflowering). Animals are classified into warm blooded and cold-blooded, vertebrates and invertebrates. New learning includes knowing the names of common woodland species, which builds on knowledge from the Blue Planet topic in Year 3. Pupils learn that environments can change and that this can sometimes pose dangers to living things. The knowledge of plants acquired in this unit will help pupils at the end of Year 4 to construct and interpret a variety of food chains, identifying producers, predators and prey. This is the precursor to work studied in Year 5 as pupils identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. They will also describe the life process of reproduction in some plants and animals. This links to work studied in Year 6 when pupils study Linnaean classification, adaptations and sexual reproduction in plants.  <b>Working Scientifically:</b> Record: Are some animals more alike than others?		
<b>Classification Key:</b> Living organisms can be sorted and identified using ‘Yes/No’ questions to identify them. <b>Leaf Arrangement:</b> The positioning of individual leaves on stalks. They can be whorled in circular patterns, opposite or alternating. <b>Leaf Edge:</b> The outer edge of a leaf. These are usually smooth or jagged (serrated). <b>Simple Leaves:</b> Leaves formed from a single leaf structure. <b>Compound Leaves:</b> Leaves formed from many leaflets. <b>Leaf Veins:</b> Small tubes criss-crossing leaves which carry water and sugar. <b>Environment:</b> An area containing many different habitats, including both living things and non-living features. Examples: Desert, Forest.			



**Habitat:** The specific area or place in which a living things both live, breed and obtain food and drink from.

**Human Impact:** Changed caused to environments by human activities.

**Species:** A specific type of living thing. Example: A rat is a species of rodent (type of mammal).

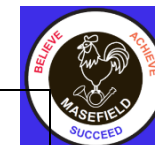
**Life Process:** Seven essential features needed for living (See: MRS GREN).

**Seasonal Change:** Changes to plant growth due to differences in the weather and temperature.

**Hibernate:** Animals enter a deep, extended sleep during winter months in order to avoid the cold and starvation due to a lack of food.

**Migration:** Animals and birds, who travel to other places, sometimes thousands of miles away, to avoid winter cold and food shortages.

NC Objectives	Knowledge Content	Working Scientifically									
<p><i>Recognise that living things can be grouped in a variety of ways</i></p> <p><i>Explore and use classification keys to help group</i></p> <p><i>Identify and name a variety of living things in their local and wider environment</i></p> <p><i>Recognise that environments can change and that this can sometimes pose dangers to living things.</i></p> <p><i>Working scientifically:</i></p> <p><i>Asking relevant questions and using different types of scientific enquiries to answer them.</i></p> <p><i>Setting up simple practical enquiries, comparative and fair tests.</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</i></p> <p><i>Gathering, recording, classifying and presenting data in a variety of</i></p>	<p>Grouping plants and animals</p> <p>Know that animals and plants can be put into different groups this is called classification.</p> <p>Warm Blooded vs Cold Blooded</p> <p>Know that animals can be divided into warm and cold blooded</p> <table border="1"> <thead> <tr> <th>Type</th><th>Definition</th><th>Example</th></tr> </thead> <tbody> <tr> <td>Warm Blooded</td><td>Animals that can make their own body heat even when it is cold outside</td><td>Humans, mammals, birds</td></tr> <tr> <td>Cold Blooded</td><td>Animals that cannot make their own heat. They need the sun's warmth to heat their bodies.</td><td>reptiles, amphibians, fish</td></tr> </tbody> </table> <p>Know that animals can be classified into vertebrates and invertebrates.</p> <p>Know that vertebrates are animals with a backbone and that invertebrates have no backbone and can be hard bodied or soft bodied.</p> <p>Know that vertebrates will include fish, amphibians, reptiles, birds and mammals.</p> <p>Invertebrates into molluscs, worms, arachnids and insects.</p> <p>Mammals are warm blooded, have fur or hair, usually give birth to live young and typically feed their young milk.</p> <p>Fish are cold blooded, breathe using gills, lay eggs and have fins.</p> <p>Reptiles are cold blooded, have dry scaly skin and lay their eggs on land. Birds are warm blooded, have feathers and lay eggs.</p> <p>Amphibians are cold blooded, breathe air but lay eggs underwater as their young use gills to breathe.</p>	Type	Definition	Example	Warm Blooded	Animals that can make their own body heat even when it is cold outside	Humans, mammals, birds	Cold Blooded	Animals that cannot make their own heat. They need the sun's warmth to heat their bodies.	reptiles, amphibians, fish	<p>Know how to use a classification key to sort animals into groups</p> <p>Know how to create a classification key to sort the UK woodland animals studied above focusing on mammals, birds, amphibians and reptiles.</p>
Type	Definition	Example									
Warm Blooded	Animals that can make their own body heat even when it is cold outside	Humans, mammals, birds									
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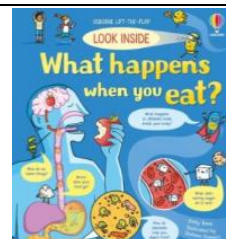
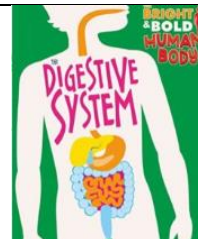


<p><i>ways to help in answering questions.</i>  <i>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</i></p> <p><i>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</i></p> <p><i>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</i></p> <p><i>Identifying differences, similarities or changes related to simple scientific ideas and processes.</i></p> <p><i>Using straightforward scientific evidence to answer questions or to support their findings.</i></p>	<p>Molluscs have soft, unsegmented bodies but use shells for protection. They live in damp, wet habitats.</p> <p>Worms are long, slender unsegmented animals that burrow underground and have no additional limbs. (Know that limb is a word used to mean arms and legs)</p> <p>Arachnids usually have segmented body parts and eight legs.</p> <p>Insects have six legs, 3 segmented body parts and generally have one or two sets of wings. Know that insects have 3 parts to their body structure head, thorax and abdomen</p> <p>Know how to identify these in a range of different insects (real and from pictures) Know the names of these common UK Woodland animals, the classification groups they are members of and identify pictures of them –</p> <p>Mammals: Weasel, badger, rabbit, bat, deer, fox, mole</p> <p>Fish: Salmon, brown trout</p> <p>Birds: Barn owls, blackbird, kestrel, cuckoo, great spotted woodpecker, kingfisher</p> <p>Reptiles: Adder, Grass Snake, Common lizard Amphibians: Common frog, Common toad, Smooth newt</p> <p>Molluscs: Slug, Garden Snail</p> <p>Arachnids: Harvestman, Garden Spider</p> <p>Worms: Common earthworm</p> <p>Insect: Peacock Butterfly, wood ant, wasp. bee, cricket, centipede, millipede, woodlouse, grasshopper</p> <p>Classifying Flowers</p> <p>Know that plants can be classified into flowering and non-flowering plants. Flowering plants such as grasses and non-flowering plants such as ferns, mosses.</p> <p>Discuss the key features of each plant group.</p> <p>Know how to identify grass and moss in the local environment</p> <p>Flowering plants will have a flower head or fruit. Non flowering plants do not produce flowers or fruit.</p> <p>Flowering plants: dandelion, buttercup, daisy, bluebell</p> <p>Non-flowering plants: fern and moss</p> <p>Changing Environments</p> <p>Know that humans can impact positively and negatively on the environment. Know that negative impacts include cutting down trees (deforestation), building roads/houses, growing population, littering, and plastic in oceans.</p>	
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	<p>Know that positive impacts include building nature reserves, protecting land, introducing different species</p> <p>e.g reintroduction of Beavers. Conservation groups such as the Royal Society for the Protection of Birds (RSPB), Tiggywinkles and Bumblebee conservation trust.</p>	
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Term:	Y4- Summer 1	Key Text(s):	 
Scientist Study:	N/A		
Unit Title:	<b>Biology: Animals including Humans</b>  <u><b>Context for study:</b></u> This unit is the sixth of eight science units where pupils study animals, including humans, as part of the discipline of biology - the study of living organisms. Pupils have a secure knowledge of life cycles and what animals, including humans, need to survive. Pupils know the importance of a healthy lifestyle, including a balanced diet and the effects of sugar, the food groups and their role in human development. Pupils can identify and name a variety of animals, including the names of animals native to the sea, rivers and canals and the features that help them to live there. Pupils can use classification keys to help group, identify and name a variety of living things in their local and wider environment. Pupils know that humans and some other animals have skeletons and muscles for support, protection and movement. In this Year 4 unit, pupils learn about the simple functions of the basic parts of the digestive system in humans. New learning includes identifying the different types of teeth in humans and their simple functions. Pupils construct and interpret a variety of food chains, identifying producers, predators and prey. This unit is the precursor to work in year 5 as pupils learn about puberty and gestation periods of animals. The knowledge acquired in this unit will help pupils in Year 6 to learn about the circulatory system and dental structures.  <b>Working Scientifically:</b> Enquire: Digestion investigation		
<b>Digestive System:</b> A series of linked organs which work together to break down food and drink. <b>Digestion:</b> The process of breaking down food to acquire energy and nutrients. <b>Mouth:</b> The part of the body where food and drink enters. <b>Teeth:</b> Hard, enamel covered parts of the mouth, used for biting, ripping and chewing food. <b>Saliva:</b> A liquid containing starch dissolving enzymes produced in the salivary glands in the mouth. <b>Oesophagus:</b> The oesophagus is like a stretchy tube that moves food from the back of the throat to the stomach. <b>Stomach:</b> An organ containing acid and amylase, where food proteins are digested. <b>Small Intestine:</b> The main function of the small intestine is absorption of nutrients and minerals from food. <b>Pancreas:</b> The pancreas produces juices called enzymes which helps the body digest food. <b>Nutrients:</b> Vitamins and minerals needed to keep people healthy.			





**Large Intestine:** The major function of the large intestine is to absorb water from the remaining indigestible food.

**Rectum:** The part of the intestines where faeces is stored and compacted.

**Anus:** The part of the digestive system where solid food waste leaves the body.

**Prey:** The term prey refers to an animal that is sought, captured, and eaten by a predator.

**Teeth:** Hard, calcified objects in the mouth used for biting, cutting and tearing food.

**Incisor:** Narrow teeth at the front of the mouth for cutting.

**Canine:** Pointy teeth that tear your food.

**Molar:** Molars are the teeth that are used for chewing and grinding our food.

**Premolars:** Wide back teeth for grinding food.

**Herbivore:** An animal that only eats plants.

**Carnivore:** An animal that only eats meat.

**Omnivore:** An animal that eats both plants and meat.

**Producer:** Something that creates its own food (usually plants).

**Predator:** Predators are wild animals that hunt, or prey on, other animals. Predator animals need the flesh of the animals that they kill to survive.

**Food Chain:** A food chain is a diagram that shows us how animals are linked by what they eat, starting with a producer.

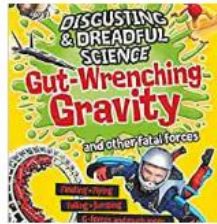

**Organ:** The skin is the biggest organ of your body. Other organs include your brain, lungs, heart, liver, stomach, intestines, pancreas, and kidneys, and they're called internal organs.

**Consumer:** Something that eats another living thing.

NC Objectives	Knowledge Content	Working Scientifically
<p><i>Describe the simple functions of the basic parts of the digestive system in humans</i></p> <p><i>Identify the different types of teeth in humans and their simple functions</i></p> <p><i>Construct and interpret a variety of food chains, identifying producers, predators and prey.</i></p> <p><i>Working scientifically:</i></p> <p><i>Asking relevant questions and using different types of scientific enquiries to answer them.</i></p>	<p>Know that digestion is the breaking down of food mechanically in the mouth before chemically in the stomach.</p> <p>Know that the mouth, tongue, teeth, oesophagus (sometimes spelled esophagus), stomach, small and large intestine make up the human digestive system.</p> <p>Know where each part is within the human body.</p> <p>Know the function of each part –</p> <ol style="list-style-type: none"> <li>1. Mouth: food enters the digestive system and is mixed with saliva to make it softer</li> <li>2. Tongue: moves food around to be broken down.</li> <li>3. Teeth: break down the food so it can travel through the oesophagus.</li> <li>4. Oesophagus: moves food from the mouth to the stomach.</li> <li>5. Stomach: uses chemicals to break down the food into small parts before passing on to the small intestine.</li> <li>6. Small intestine: digested food here is passed into the bloodstream where it can be taken to the body parts that require it.</li> <li>7. Large intestine: any food leftover is unwanted, and is passed along the large intestine to the rectum.</li> </ol>	<p>Compare the teeth of humans with carnivores and herbivores.</p> <p>Know that carnivores eat only meat. Their teeth have more canines as they will rip and tear food more. e.g. Lion's teeth.</p> <p>Know that herbivores eat only plant life. Their teeth have more molars as they grind and break down vegetation more. e.g Zebra's teeth.</p> <p>Know that humans are omnivores and have a more</p>



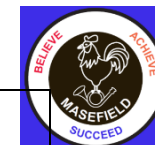
<p><i>Setting up simple practical enquiries, comparative and fair tests.</i></p> <p><i>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</i></p> <p><i>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</i></p> <p><i>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</i></p> <p><i>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</i></p> <p><i>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</i></p> <p><i>Identifying differences, similarities or changes related to simple scientific ideas and processes.</i></p> <p><i>Using straightforward scientific evidence to answer questions or to support their findings.</i></p>	<p>Know that, without digestion, we could not absorb nutrients from food into our bodies and use them.</p> <p><b>Teeth</b></p> <p>Know that there are different teeth for different purposes.</p> <p>Incisors: the front teeth help bite off chunks of food to be broken down.</p> <p>Canines: pointed teeth designed to rip and tear meat and fish. (Premolars and)</p> <p>Molars: flatter, thicker teeth at the back of the mouth designed to crush and grind food.</p> <p>Know that you get two sets of teeth during your lifetime - the first set is often called the milk or baby teeth.</p> <p>Know that a child has 20 teeth and an adult has 32.</p> <p>Know that adults have wisdom teeth which grow at the end of each row of teeth. These are often removed in adults because they can affect the growth of the teeth nearby and can be painful.</p> <p>Know that it is important to look after teeth by brushing at least twice a day for two minutes at a time. It is important to use toothpaste which contains fluoride as this protects teeth from tooth decay.</p> <p>Know that you can also use mouthwash and dental floss to help look after your teeth.</p> <p><b>Food Chains</b></p> <p>Know that a food chain is a series of living things which are linked to each other because each thing feeds on the one next to it in the series.</p> <p>Know that plants are producers, and create their own food through a process called photosynthesis (which they will find out about in secondary school)</p> <p>Know that all animals are consumers, they eat food (either plants or other animals) rather than produce their own (as plants are able to)</p> <p>Know that prey are animals that are consumed by other animals and predators are animals that consume other animals.</p> <p>Understand that some animals can be both predator and prey (e.g. a baboon eats grasshoppers but is eaten by a leopard)</p> <p>Know the following food chains:</p> <p>Plant Roots (producer) -&gt; Zebra (prey) -&gt; Lion (predator) Green shoots (producer) -&gt; antelope (prey) -&gt; crocodile (predator)</p> <p>Grass (producer) -&gt; grasshopper (prey) -&gt; Baboon (predator + prey) -&gt; Leopard (predator).</p> <p>Grass (producer) -&gt; cow (prey) -&gt; human (predator).</p>	<p>balanced diet of plants and animals.</p>
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Term:	Y5- Autumn 1	Key Text(s):	 
Scientist Study:	<b>Galileo Galilei (1564-1642)</b> A scientist from Italy who discovered that when you drop two objects of similar shape and size but of different mass they will fall at the same rate.		
Unit Title:	<b>Physics: Forces</b>  <u><b>Context for study:</b></u> This unit is the first of three science units where pupils study forces as part of the discipline of physics - the study of the processes that shape our world and how we use it. Pupils have a secure knowledge of resistance and friction, are able to compare how things move on different surfaces and know that applying forces to objects can change their shape. In Year 5, pupils revise and build upon previous learning on magnetism. They know some forces need contact between two objects, but magnetic forces can act at a distance. Pupils know magnets have two poles and that they attract or repel each other. Pupils further develop their knowledge of magnetic and non-magnetic materials with thermal and electrical conductivity. New learning in this unit includes knowing that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Pupils study the effects of air resistance, water resistance and friction that act between moving surfaces. By the end of the unit, pupils will know that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. The knowledge acquired in this unit will help pupils as they learn more about materials and their properties.  <b>Working Scientifically:</b> Explore: How do parachutes work?		
<b>Force:</b> The strength of a physical action or movement measured in Newtons (N). <b>Gravity:</b> Gravity is a force which tries to pull two objects toward each other. <b>Air Resistance:</b> Air resistance is a type of friction between air and another material. For example, when an aeroplane flies through the air or a parachute falls to Earth. <b>Water Resistance:</b> If you go swimming, there is friction between your skin and the water particles. <b>Simple Machines:</b> Devices that change the direction or magnitude of forces. These include <b>gears</b> , <b>levers</b> and <b>pulleys</b> . They are often combined together to form <b>mechanisms</b> . <b>Friction:</b> Friction is a force between two surfaces that are sliding, or trying to slide, across each other. <b>Levers:</b> A lever can be described as a long rigid body with a fulcrum along its length. <b>Pulleys:</b> Pulley is a simple machine and comprises of a wheel on a fixed axle, with a groove along the edges to guide a rope or cable.			



**Gears:** Gears are wheels with teeth that slot together. When one gear is turned the other one turns as well.

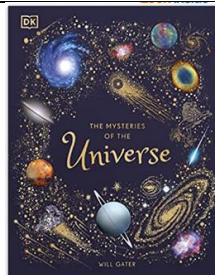

NC Objectives	Knowledge Content	Working Scientifically
<p><i>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</i></p> <p><i>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</i></p> <p><i>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</i></p> <p><i>Working scientifically:</i></p> <p><i>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</i></p> <p><i>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</i></p> <p><i>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.</i></p> <p><i>Using test results to make predictions to set up further comparative and fair tests.</i></p> <p><i>Reporting and presenting findings from enquiries, including conclusions, causal relationships</i></p>	<p><b>Gravity</b>            Know that the force that pulls things to the ground on Earth (and other planets) is called gravity.            Know that gravity acts as a pull force making unsupported objects fall towards Earth.            Know that gravity pulls towards earth wherever you are on Earth.            Know that gravity holds Earth and the other planets in their orbits around the Sun.</p> <p><b>Friction, Air Resistance and Water Resistance</b>            Know that friction occurs when objects move through water or air. Air resistance is a type of friction between air and another material (this is sometimes called drag).            Know that as an object moves, air resistance slows it down. The faster the object's motion, the greater the air resistance exerted against it. Air resistance affects all moving objects.            For example, when an aeroplane flies through the air, air particles hit the aeroplane making it more difficult for it to move through the air.</p> <p><b>Isaac Newton</b>            To know that Sir Isaac Newton (1642 - 1726) was an English mathematician and scientist. He is known as one of the most influential scientists of all time. He developed Newton's law of universal gravitation.            Know that he is said to have 'discovered' the concept of gravity when sitting under a tree and an apple fell to the ground near him. There is a common myth that the apple landed on his head which is generally considered to be untrue. Newton also discovered that white light was made from a range of colours (review previous work on rainbows and the colour spectrum).            Know that he is buried in Westminster Abbey with other famous people Charles Dickens, Charles Darwin, Queen Elizabeth I and most recently Professor Stephen Hawking</p> <p><b>Galileo Galilei</b>            To know that Galileo Galilei (1564 - 1642) was a scientist from Italy. He discovered that when you drop two objects of similar shape and size but of different mass they will fall at the same rate. This went against the common sense idea at the time from Aristotle who believed that heavier objects fell faster. He is said to have dropped objects from the Leaning Tower of Pisa to demonstrate this. Most scientists and historians believe this was a</p>	<p>Observe the fall of sycamore seeds. Demonstrate how a paper helicopter can act as a model of a sycamore seed. Know how air pushes the blades of the paper helicopter as it falls and causes it to rotate.</p> <p>Conduct an experiment to test parachutes and measure air resistance with designs that are different sizes. Use graphs to map the results.</p>



<p><i>and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</i></p> <p><i>Identifying scientific evidence that has been used to support or refute ideas or arguments.</i></p>	<p>'thought experiment' and did not actually happen. A thought experiment is when you imagine the outcome of an experiment rather than carry it out directly.</p> <p>Know that water resistance acts in the same way that air resistance does. If you go swimming, there is friction between your skin and the water particles. This is known as water resistance. When something is in water, there are two forces acting on it. Its weight and the force of the water pushing up, the upthrust. If the weight is equal to or less than the upthrust, it floats. Things that float are 'buoyant'.</p> <p>Know that 'buoyancy' is the ability of an object to float in liquid or the air.</p> <p>Know that a buoy is a floating object that is used to show ships and boats where they can go and to warn them of danger.</p> <p>Know that if the weight of an object is greater than the upthrust, it sinks.</p> <p>Know how to use arrows on diagrams to show the forces at work in given situations e.g. submarine in water, parachute falling, car moving on the road.</p> <p><b>Levers, Pulleys and Gears</b></p> <p>Know that levers, pulleys and gears are mechanisms that allow a small force to have a greater effect.</p> <p>Know that a lever is a simple mechanism used to move or lift objects.</p> <p>Know how to label a diagram showing a lever, load, effort and a fulcrum or pivot.</p> <p>Know that the nearer the fulcrum/pivot to the load then the less effort is needed.</p> <p>Know that a seesaw works because the fulcrum is in the middle.</p> <p>Consider what would happen if a seesaw had the fulcrum closer to one end.</p> <p><b>Gears</b></p> <p>Know that gears are toothed wheels that lock together and turn each other.</p> <p>Know that gears are often different sizes.</p> <p>A number of gears connected together are called a gear train. Small gears rotate faster than large ones and need less effort to move.</p> <p>Know that gears on a bike enable us to go faster than we could normally move without using up a lot of energy.</p> <p>For further information - <a href="https://www.dkfindout.com/uk/science/simple-machines/gears/">https://www.dkfindout.com/uk/science/simple-machines/gears/</a> Watch examples of gears - <a href="https://www.youtube.com/watch?v=D_i3PJlYtuY">https://www.youtube.com/watch?v=D_i3PJlYtuY</a></p> <p><b>Pulley</b></p>	
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	Know that a pulley is a device consisting of a wheel over which a rope or chain is pulled in order to lift heavy objects. Know that when someone raises a flag up a flagpole a pulley system is used.	
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Term:	Y5- Autumn 2	Key Text(s):		
Scientist Study:	N/A			
Unit Title:	<h2>Physics: Earth and Space</h2> <p><b>Context for study:</b> This unit is the last of three science units where pupils study forces as part of the discipline of physics - the study of the processes that shape our world and how we use it. Pupils have a secure knowledge of the effects of air resistance, water resistance and friction that act between moving surfaces. Pupils know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Previous learning includes how some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Pupils know about magnetic and non- magnetic materials, and thermal and electrical conductivity. They know some forces need contact between two objects, but magnetic forces can act at a distance. Pupils know magnets have two poles and that they attract or repel each other. In this Year 5 unit, pupils describe the Sun, Earth and Moon as approximately spherical bodies. New learning includes knowing about the movement of the Earth, and other planets, relative to the Sun in the solar system. Pupils learn the movement of the Moon relative to the Earth. By the end of the unit, pupils use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. This unit is the precursor to work studied in KS3 when pupils continue to study forces as part of the discipline of physics. The knowledge acquired in this unit will help pupils as they learn more about forces and movement, including measuring forces</p> <p><b>Working Scientifically:</b> Record: What shape is the moon and does it change?</p>			
<p><b>Phases:</b> one of the stages of the moon or smaller planets as they change their relation to the sun.</p> <p><b>Rotation:</b> the act of turning on or around an axis.</p> <p><b>Orbit:</b> An orbit is a repeating path that one celestial body takes around another.</p> <p><b>Planets:</b> There are 8 planets in our solar system, they are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.</p> <p><b>Seasons:</b> one of the four parts of the year; spring, summer, fall, and winter.</p> <p><b>Star:</b> any of a vast number of heavenly bodies visible from earth as points of light in the night sky.</p> <p><b>Hemisphere:</b> either of two halves of the earth.</p> <p><b>Moon:</b> the earth's natural satellite.</p>				





**Poles:** either end of a planet's, moon's, or star's axis.

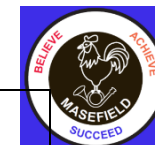
**Space:** the area that contains the entire material world and its events.

**Reflect:** to throw back from a surface.

**Solar System:** The solar system is made of the eight planets that orbit our sun it is also made of asteroids, moons, comets and lots, lots more.

NC Objectives	Knowledge Content	Working Scientifically
<p><i>Describe the movement of the Earth and other planets relative to the sun in the solar system.</i></p> <p><i>Describe the movement of the moon relative to the Earth.</i></p> <p><i>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</i></p> <p><i>Working scientifically:</i></p> <p><i>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</i></p> <p><i>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</i></p> <p><i>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.</i></p> <p><i>Using test results to make predictions to set up further comparative and fair tests.</i></p>	<p><b>Sun, Moon, Earth</b></p> <p>Know that the Earth, sun and moon are approximately spherical bodies in space.</p> <p>Know that the sun is a star and the moon is a satellite, not planets.</p> <p>Know that the Earth rotates once every 24 hours.</p> <p>Know that this creates day and night as the Earth takes 24 hours to complete one spin on its axis.</p> <p>Know that the Earth orbits around the sun once every 365 and a quarter days (one year).</p> <p>Know that the sun is the ball of gas in the sky that the Earth goes round, and that gives us heat and light.</p> <p>Know that it is not safe to look directly at the Sun, even when wearing dark glasses</p> <p>Know that the orbit is the curved path in space that is followed by an object going round and round a planet, moon, or star</p> <p>Know that every 4 years the Earth year is 366 days long due to the 4 quarter days equalling an extra day. We refer to this as a leap year. Know that the extra day occurs on Feb 29th.</p> <p>Know that the Earth spins on an imagined axis, tilted at approximately 23° Explain how this also alters how we see the sun in different positions in the sky throughout the day, and this makes the sun look as if it is moving when it is in fact Earth.</p> <p>Know that the sun appears to rise in the east and sets in the west.</p> <p><b>Time Zones</b></p> <p>Know that there are different time zones across the world because of the rotation of the earth.</p> <p>Know that as you move eastwards from the UK you add time on. E.g. Sydney, Australia you add 11 hours.</p> <p>Know that as you move westwards you subtract time. E.g. Los Angeles, USA you subtract 8 hours.</p> <p><b>Moon</b></p> <p>Know that the moon is not a light source it reflects the light from the sun.</p> <p>Know that the moon orbits our Earth every 28 days, and this is called the lunar cycle.</p> <p>Know that Earth has one moon; Jupiter has four large moons and numerous smaller ones.</p>	







<p><i>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.</i></p> <p><i>Identifying scientific evidence that has been used to support or refute ideas or arguments.</i></p>	<p>(no requirement to teach the names of the phases of the moon)</p> <p>Know that over 28 days the moon goes from a full moon to a sequence of shrinking crescent moons to a new moon (not visible) a sequence of increasing crescent moons to a full moon over 28 days.</p> <p>Know that the force of gravity also exists on the Moon but it is not as strong as it is on Earth. This is because the Moon is much smaller than our planet.</p> <p><b>Galileo Galilei (1564-1642)</b></p> <p>Recap learning from previous Forces unit. Italian astronomer, physicist and engineer. Proved the heliocentric model of the solar system, mapped the Moon, discovered the four largest (Galilean) moons of Jupiter and observed Saturn's rings after perfecting the modern telescope.</p> <p><b>Solar System</b></p> <p>Know the names of the planets in our solar system in order from the sun - Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, (Pluto).</p> <p>Know that recently Pluto has been designated as a dwarf planet and is no longer included as a planet in the solar system.</p> <p>Know the mnemonic - My Very Easy Method Just Speeds Up Naming Planets</p> <p>Know that there is an asteroid belt between Mars and Jupiter</p> <p>Know the approximate relative size of planets from this diagram.</p> <p>Know that planets have their own moons</p> <p>Know that only Earth is habitable.</p> <p>The gas giants are: Jupiter, Saturn, Uranus and Neptune.</p> <p>The others are terrestrial planets: terra meaning land.</p> <p><b>Solar System Models</b></p> <p>Know the way that ideas about the solar system have developed,</p> <p>Know how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus.</p> <p><b>Planets</b></p> <p>Know that the planet names are derived from Roman and Greek mythology, except for the Earth which is Germanic and Old English in origin.</p> <p>Mercury: named after the Roman messenger god who was known for his ability to travel quickly with wings on his feet.</p>	
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	<p>Venus: named after the goddess of love and beauty. The planet Venus is the brightest object in our sky after the sun and the moon.</p> <p>Earth: the name comes from the German word 'erde' which means ground. This is the odd one out as it is not based on Roman or Greek Mythology.</p> <p>Mars: the Roman god of war. Red is the colour of blood and war and Mars is the Red Planet. The colour is due to a type of rust in the soil.</p> <p>Jupiter: the supreme god of the ancient Romans. The planet Jupiter, the largest planet in our solar system, is named after the king of the gods,</p> <p>Saturn: the king of the Titans who ruled the world before Jupiter. Saturn has over 30 moons in orbit</p> <p>Uranus: the Roman sky god.</p> <p>Neptune: named after the Roman god of the sea. For many years, Neptune was thought to lie on the edge of the Solar System, watching over the vast oceans of space.</p> <p>Pluto: Pluto was the brother of Jupiter and Neptune and the god of the underworld. The underworld was supposed to be dark and cold just like the planet Pluto.</p>	
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Term:	Y5- Spring 1	Key Text(s):		
Scientist Study:	N/A			
Unit Title:	<b>Biology: Living Things and their Habitats</b>  <u><b>Context for study:</b></u> This unit is the fifth of six science units where pupils learn about plants and animals as part of the discipline of biology- the study of living organisms. Pupils have a secure knowledge of the functions of the different parts of flowering plants and the requirements of plants for life and growth. They know how water is transported within plants and the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Pupils can identify and name a variety of living things in their local and wider environment and use classification keys to help group plants and animals. In Year 5, pupils revise their prior knowledge of food chains, identifying producers, predators and prey. This unit builds on pupils’ understanding of how environments can change and that this can sometimes pose dangers to living things. Pupils identify how animals and plants of the Amazon rainforest are adapted to suit their environment in different ways and that adaptation may lead to evolution. New learning includes knowing particular species of animals and plants of the Amazon rainforest and describing the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Pupils further develop their knowledge of the seven life processes. The knowledge acquired in this unit will help pupils understand the life process of reproduction in some plants and animals. This is the precursor to work studied in Year 6 when pupils study Linnaean classification, adaptations and sexual reproduction in plants and animals.  <b>Working Scientifically:</b> Explain: If life has existed for billions of years, why are there still people alive today?			
<b>Life Cycle:</b> The series of changes in the life of an organism including reproduction <b>Reproduce:</b> To have off-spring. <b>Sexual Reproduction:</b> Offspring get genes from both mum and dad, inheriting a mix of features from both. <b>Sperm/Egg:</b> The male and female cells used in reproduction. They carry DNA. <b>Fertilises:</b> The fusion (joining) of pollen or sperm to the egg to create a new cell with DNA from both parents. This grows into the new organism. <b>Live Young:</b> Born without the need for eggs (most mammals). <b>Metamorphosis:</b> The process of complete change in body type and shape during a life-cycle. <b>Plantlets:</b> New plants growing asexually from the end of runners.				



**Runners:** Horizontal stems, which grow across the ground. Part of asexual reproduction. Plantlets grow from these.

**Asexual Reproduction:** Offspring get genes from one parent so are clones of their parents

**Bulbs:** An underground storage structure, from which new shoots and roots grow, forming new plants.

**Cuttings:** Stems of plants cut and regrown into full plants. Cuttings can be combined to create new plants.

**Pollination:** The process of pollen (male) making contact with the style (female part) of a flower. A pollen tube is grown, down which the pollen grain travels to fertilise the egg in the ovule.

NC Objectives	Knowledge Content	Working Scientifically
<p><i>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.</i></p> <p><i>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</i></p> <p><i>Construct and interpret a variety of food chains, identifying producers, predators and prey</i></p> <p><i>Working scientifically:</i></p> <p><i>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</i></p> <p><i>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</i></p> <p><i>Recording data and results of increasing complexity using</i></p>	<p>Know that an ecosystem is 'all the plants and animals that live in a particular area together and the relationship between them and the environment'.</p> <p>Know that a tropical rainforest is an ecosystem consisting of 'wet, warm forest all year round'.</p> <p>Understand the term biodiversity as 'the variety of animals and plant life in a particular ecosystem'.</p> <p>Know that rainforests are home to approximately 50% of all living things on earth.</p> <p>Know the names of the following species of animals which live in the Amazon rainforest and whether they are herbivores, carnivores or omnivores: giant anteater, green iguana, tapir, anaconda, poison dart frog, sloth, macaw, jaguar, armadillo, howler monkey, piranha, hummingbird, leaf cutter ants, porcupine, tarantula and toucan.</p> <p>Know the names of the following species of plants which live in the Amazon rainforest and identify images of these: rubber tree, orchid, cacao, giant water lilies and banana tree.</p> <p>Know the following food chain - orchid (producer), butterfly (consumer), toucan (consumer), jaguar (consumer).</p> <p>Use the terms predator and prey to describe the relationships in the food chain.</p> <p>Know that all food chains begin with Solar Energy.</p> <p>Know that a number of different species each year become extinct as a result of deforestation. Know that extinct means 'no longer in existence'. e.g. dodo</p> <p>Adaptations In biology, an adaptation is defined as 'the process of change by which an organism or species becomes better suited to its environment.'</p> <p>Know that piranhas have adapted to live and hunt in schools, they have sharp teeth, they have interlocking jaws, and they have an acute sense of hearing to detect prey.</p>	<p>Identify differences between the life cycles.</p>



*scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.*

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

*Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.*

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

Understand the term evolution as 'the process by which different kinds of living organisms are believed to have developed from earlier forms during the history of the earth'.

Know that adaptations can lead to evolution of species. (Explain that they will learn more about this in Year 6) Life processes and life cycles

Revise the seven life processes (from Y2) are:

Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion and Nutrition.

Use the acronym MRS GREN to recall these:

M	Movement	All living things move, even plants.
R	Respiration	Getting energy from food.
S	Sensitivity	Detecting changes in the surroundings.
G	Growth	All living things grow.
R	Reproduction	Making more living things
E	Excretion	Getting rid of waste.
N	Nutrition	Taking in and using food.

Life Cycles Jaguar (mammal)

Live young > kitten > adult

Females have between one and four kittens in each litter. She will give birth in a cave den or a thicket. The kittens are born with their eyes closed. At birth they have fuzzy spotted fur. The kittens begin to hunt when they are six months old. They will stay with their mother for about two years. The jaguar has a lifespan of 15-20 years.

Poison dart frog (amphibian), frog spawn > tadpole > froglet > adult frog

<https://nationalaquarium.wordpress.com/2013/07/16/the-life-cycle-of-poison-dart-frogsexplained/>

Leaf cutter ant (insect)



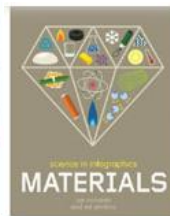
Know that the life cycle of the ant consists of four stages: egg, larva, pupa, and adult. Fertilized eggs produce female ants (queens, workers, or soldiers); unfertilized eggs produce male ants.

Egg: Ant eggs are oval shaped and tiny (they are about 1 mm long)



	<p>Larva: The worm-like larvae have no eyes and no legs. The larvae molt (shed their skin) many times as they increase in size.</p> <p>Pupa: After reaching a certain size, the larva spins a silk-like cocoon around itself (against a solid object) and pupates. During this time the body metamorphoses (changes) into its adult form.</p> <p>Adult: The pupa emerges as an adult. The entire life cycle usually lasts from 6 to 10 weeks. <a href="http://www.enchantedlearning.com/subjects/insects/ant/leafcutter.shtml">http://www.enchantedlearning.com/subjects/insects/ant/leafcutter.shtml</a></p> <p>Hummingbird (bird). Egg &gt; Young &gt; Adult <a href="https://sciencing.com/life-cycle-hummingbird-5417886.html">https://sciencing.com/life-cycle-hummingbird-5417886.html</a></p>	
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Term:	Y5- Spring 2	Key Text(s):	  
Scientist Study:	N/A		
Unit Title:	<b>Chemistry: Properties and changes of materials</b>  <u><b>Context for study:</b></u> This unit is the fifth of five science units where pupils study materials as part of the discipline of chemistry - the identification of the properties a substance is made from. It is also the study of forces as part of the discipline of physics – the study of the processes that shape our world and how we use it. Pupils have a secure knowledge of the properties of materials and can identify and compare the suitability of a variety of everyday materials. Pupils know how things move on different surfaces and pupils know that squashing, bending, twisting and stretching can change the shapes of some solid objects. Pupils have studied the work of John Dunlop, John MacAdam and Mary Anning. Previous learning includes knowing different kinds of rocks on the basis of their appearance and simple physical properties. Pupils know how fossils are formed and recognise that soils are made from rocks and organic matter. In this year 5 unit, pupils further develop their knowledge as they compare and group together everyday materials on the basis of their properties, including hardness (using Moh’s Hardness Scale) solubility, transparency, electrical and thermal conductivity. Pupils revise their prior knowledge of magnetic and non-magnetic metals from Year 3. New learning includes knowing that some materials will dissolve in liquid to form a solution, and knowing how to recover a substance from a solution. This unit also builds on pupils’ previous knowledge of states of matter. Pupils know that some materials change state when they are heated or cooled (e.g. evaporation and condensation in the water cycle) and associate the rate of evaporation with temperature. Pupils use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. The knowledge acquired during this unit will help pupils understand that dissolving, mixing and changes of state are reversible changes. By the end of the unit, pupils will be able to 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. This unit is the precursor to work studied in KS3 as pupils continue to learn about states of matter.  <b>Working Scientifically:</b> Enquire: Is it possible to separate materials?		
<b>Thermal Conductor:</b> A material through which heat can easily travel. <b>Thermal Insulator:</b> A material which prevents heat travel. <b>Electrical Conductor:</b> A material which allows the flow of electricity through it.			



**Electrical Insulator:** A material which blocks the flow of electricity.

**Object:** Anything created for a purpose using different materials. Example: a stapler, a table.

**Material:** The matter from which other things are made. Examples: metal, plastic, glass.

**Property:** The way in which a material behaves. Example: impermeable (waterproof).

**Mixture:** Two or more materials put together.

**Dissolve:** A solid becomes broken up or absorbed by something or to disappear into something else. It looks as if the solid has disappeared – it has not.

**Solution:** Liquids (solvents) containing dissolved solids (solute).

**Filter:** The removal of solids from liquids using microscopic holes, allowing only the water to pass through.

**Sieve:** Using holes to separate solids of different sizes.

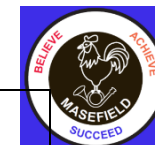
**Reversible Change:** A mixture of materials that can be undone. New materials are created.

**Irreversible Change:** A mixture of materials which undergo a chemical reaction or change, creating new substances. You cannot get your original materials back.

**Solubility:** Is a chemical property referring to the ability for a given substance, the solute, to dissolve in a solvent.

NC Objectives	Knowledge Content	Working Scientifically
<p><i>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</i></p> <p><i>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</i></p> <p><i>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</i></p> <p><i>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</i></p>	<p>Know how to compare materials based on the properties of hardness, solubility (how easily dissolvable it is), transparency, magnetism, conductivity of thermal (heat) and electricity.</p> <p>Know that different materials will have different purposes, based on their properties.</p> <p><b>Hardness</b></p> <p>Know that hardness can be measured by observing if one material can scratch another.</p> <p>Know that a common scale for doing this is Moh's Hardness Scale developed in 1812</p> <p>Know how to conduct a scratch test.</p> <ol style="list-style-type: none"> <li>1. If Specimen A can scratch Specimen B, then Specimen A is harder than Specimen B.</li> <li>2. If Specimen A does not scratch Specimen B, then Specimen B is harder than Specimen A.</li> <li>3. If the two specimens are equal in hardness then they will be relatively ineffective at scratching one another. Small scratches might be produced, or it might be difficult to determine if a scratch was produced.</li> <li>4. If Specimen A can be scratched by Specimen B but it cannot be scratched by Specimen C, then the hardness of Specimen A is between the hardness of Specimen B and Specimen C.</li> </ol> <p><b>Solubility</b></p> <p>Know that solubility is the ability of a substance to dissolve</p> <p>Know that dissolving is when a solid material mixes with a liquid and is no longer visible.</p> <p>Know that materials dissolved into liquid will create a solution: salt water, sugar water.</p>	<p>Know how to conduct a simple scratch test on familiar items.</p> <p>Know that to get the salt or sugar back (the substance), the solution can be heated to evaporate the water from the substance. (Using a cold surface above the heat will catch the vapour and return it to liquid water)</p> <p>Observe the process and record findings.</p>





*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.*

*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 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 graph.*

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

*Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.*

Know that there is a limit to how much material can be dissolved in a given liquid. This is called saturation point. After this no more material will be dissolved it will be visible.

Know that the hotter the solution the faster the dissolving process occurs.

Know that stirring a solution can speed up the dissolving process.

Transparency

Revise vocab from previous year - transparent, translucent, opaque

Magnetism

Revise vocab from Y3 unit - north and south pole, magnetic field, attract, repel.

Magnetic Materials	Non-Magnetic Material
1. Iron	1. Aluminium
2. Steel	2. Copper
3. Nickel	3. Gold
	4. Silver

Thermal Conductivity

Know that the term thermal refers to heat

Know that a thermal conductor is a material that allows heat to be transferred easily

Know that a thermal insulator does not conduct heat well.

Know that a metal spoon heats up more quickly than a plastic one in a hot drink.

Know that metal (such as aluminium and steel) conducts heat well so it is used to make saucepans so is known as a good thermal conductor.

Know that wood does not conduct heat well so is often used for handles of saucepans.

Know that plastic does not conduct heat well so is a thermal insulator.

Electrical Conductivity

Know that an electrical conductor allows electricity to flow through it.

Know that an electrical insulator does not.

Know that rubber is used for coating copper wires, as it is a poor conductor of electricity.

Know that iron is used in circuits as it will conduct electricity.

Know that silver, copper, gold and aluminium are the most effective electrical conductors.

Separating Solids and Liquids



<i>Identifying scientific evidence that has been used to support or refute ideas or arguments.</i>	<p>Know that solids, liquids and gases can be separated using filtering, sieving and evaporation.</p> <p>Know the following terms</p> <p>Filtering: separates an insoluble solid from a liquid.</p> <p>Sieving: separates solids of different sizes.</p> <p>Evaporation: separating dissolved substances from liquids.</p> <p>Reversible and Irreversible Changes</p> <p>Know that reversible changes are changes that are not permanent.</p> <p>Dissolving, mixing and altering states are reversible changes.</p> <p>Water can be altered from solid to liquid, to gas and back.</p> <p>Butter can be melted then will solidify. Know that solidify means 'to become a solid'</p> <p>Know that some changes result in the making of a new material, and that this is irreversible. Bread, wood, paper that is burnt cannot be returned to its original state.</p> <p>Know that cooking an egg is an example of an irreversible change.</p> <p>Know that adding acid to bicarbonate of soda results in the bicarbonate breaking down into salt, water and gas. The resulting product cannot be transformed back into its original form.</p>	
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Term:	Y5- Summer 1	Key Text(s):	
Scientist Study:	N/A		
Unit Title:	<b>Biology: Animals including Humans</b>  <u><b>Context for study:</b></u> This unit is the seventh of eight science units where pupils study animals, including humans, as part of the discipline of biology - the study of living organisms. Pupils have a secure knowledge of life cycles and what animals, including humans, need to survive. Pupils can use classification keys and interpret food chains: identifying producers, predators and prey. Pupils know that humans and some other animals have skeletons and muscles for support, protection and movement. Previous learning includes the importance of a healthy lifestyle, including a balanced diet and the effects of sugar, the food groups and their role in human development. Pupils know the functions of the basic parts of the digestive system and the functions of different types of teeth in humans. In this Year 5 unit, pupils learn about the changes a human goes through as they develop across their lifetime. Pupils describe the changes as humans mature to old age and draw a timeline to indicate stages in the growth and development. Pupils learn what older people need to stay healthy and the difficulties they may face, including memory loss and a weakened immune system, as a result of old age. In SRE sessions, pupils learn how babies grow and develop, and about puberty. New learning includes the gestation period and life expectancy of different species of animals. Pupils also undertake an extended study of the Mayfly. This unit is the precursor to work in Year 6 as pupils learn about the circulatory system and dental structures.  <b>Working Scientifically:</b> Explain		
<b>Life Cycle:</b> The series of changes in the life of an organism including reproduction <b>Reproduce:</b> To have off-spring (children in humans). <b>Sexual Reproduction:</b> Offspring get genes from both mum and dad, inheriting a mix of features from both. <b>Sperm/Egg:</b> The male and female cells used in reproduction. They carry DNA. <b>Live Young:</b> Born without the need for eggs. <b>Puberty:</b> Is the name for the time when your body begins to develop and change as you move from childhood to adult. <b>Adolescence:</b> The transition phase between childhood and becoming an adult. These are usually teenage years. <b>Foetus:</b> A human child still developing within the mother’s uterus (womb). <b>Infant:</b> A human baby. Toddler: Babies who develop the ability to sit up independently, manipulate objects, follow verbal instructions and begin to walk unaided. <b>Child:</b> A human who has not yet reached puberty / adolescence. <b>Adult:</b> A fully grown human capable of reproduction.			



NC Objectives	Knowledge Content	Working Scientifically																								
<p><i>Describe the changes as humans develop to old age.</i></p> <p><i>Working scientifically:</i></p> <p><i>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</i></p> <p><i>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</i></p> <p><i>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.</i></p> <p><i>Using test results to make predictions to set up further comparative and fair tests.</i></p> <p><i>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.</i></p> <p><i>Identifying scientific evidence that has been used to support or refute ideas or arguments.</i></p>	<p>The study of animals, including humans regarding the changes a human goes through as they develop across their lifetime is part of the discipline of biology - the study of living organisms.</p> <p>To know that all humans grow and develop from the time they are born until old age.</p> <p>To know the terms baby, toddler, child, teenager, adolescent, adult and pensioner and the periods with which they roughly refer:</p> <p>Baby: 0 - 1 year Toddler: 1 - 3 years Child: 3 - 12 years Teenager/ adolescent: 12 - 18 years Adult: 18+ years Pensioner (old age): 65+ years</p> <p>To know that puberty is when changes occur in the body during adolescence. It is the end of the development of the body.</p> <p>Draw a timeline to indicate stages in the growth and development of humans.</p> <p>Know that an embryo develops into a foetus in the mother's womb and that over time the foetus develops typical human features including arms and legs.</p> <p>Gestation Periods</p> <p>Know that nearly all mammals are viviparous - they give birth to live young rather than laying eggs.</p> <p>Know that the gestation is the development of an embryo up to the point of birth.</p> <p>Know that an embryo is an unborn animal at the very early stages of development.</p> <p>Know that the gestation period refers to the time an embryo spends in development in the womb.</p> <p>Know that an embryo develops into a foetus (in humans this is after 8 weeks) Know the following gestation periods:</p> <table border="1" data-bbox="808 1077 1420 1481"> <thead> <tr> <th>Animal</th><th>Average Gestation Period in days</th><th>Average Gestation Period in Months</th></tr> </thead> <tbody> <tr> <td>Rat</td><td>21 days</td><td>Less than a month</td></tr> <tr> <td>Rabbit</td><td>31 day</td><td>1 month</td></tr> <tr> <td>Cat/Dog</td><td>63 days</td><td>2 months</td></tr> <tr> <td>Human</td><td>275 days</td><td>9 months</td></tr> <tr> <td>Horse</td><td>336 days</td><td>11 months</td></tr> <tr> <td>Killer Whale</td><td>465 days</td><td>15 months</td></tr> <tr> <td>Elephant</td><td>624 days</td><td>20 months</td></tr> </tbody> </table>	Animal	Average Gestation Period in days	Average Gestation Period in Months	Rat	21 days	Less than a month	Rabbit	31 day	1 month	Cat/Dog	63 days	2 months	Human	275 days	9 months	Horse	336 days	11 months	Killer Whale	465 days	15 months	Elephant	624 days	20 months	
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Know that the general rule is 'the bigger the animal, the longer the gestation period' Know that these gestation periods are averages and that sometimes this period is longer and shorter.

#### Old Age

Know that there are a number of changes as adults move into old age.

Know that older people need a different diet to stay healthy, they may keep their teeth throughout old age, they need to exercise, they can learn new information.

Know that some older people suffer from severe memory loss (become senile) Know that some older people have difficulty in moving around and may use a walking stick or frame.

Know that the immune system becomes weaker in old age and it is more difficult for the body to fight off illness.

Know that the immune system defends people against germs and microorganisms every day. In most cases, the immune system does a great job of keeping people healthy and preventing infections. But sometimes problems with the immune system can lead to illness and infection.

#### Life Expectancy

Know that life expectancy is the length of time that a particular species of animal is expected to live. Know the following animals and their life expectancies:

Species	Life Expectancy
Mayfly	1 day
Rat	1 year
Salmon	3 years
Human	68 years
Killer Whale	70 years

Know that the general rule is 'the longer the gestation period the longer the life expectancy'.

#### Mayfly study

Know that Mayfly are famous for having a very short life span/expectancy



	<p>Know that all animals also have Latin names and that a mayfly is known as Ephemeroptera.</p> <p>Know that the word 'ephemeral' is used to describe something which lasts for a very short time.</p> <p>Know that mayfly begin life in an egg which hatches into the nymph phase for one year before they become adult flies. K</p> <p>now that a nymph is the larva or young of an insect</p> <p>Know that larva is the form a young insect takes before it metamorphoses into an adult.</p> <p>Know that adult mayfly only live to reproduce they do not eat and do not even have functioning mouth parts.</p> <p>Know that often mayflies in a given population hatch at the same time.</p> <p>Know that the adult females of some species live for less than five minutes.</p> <p>Know that females typically lay between four hundred and three thousand eggs. The eggs are often dropped onto the surface of the water; sometimes the female deposits them by dipping the tip of her abdomen into the water during flight.</p>	
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Term:	Y6- Autumn 1	Key Text(s):	
Scientist Study:	N/A		
Unit Title:	<b>Biology: Animals including Humans</b>  <u><b>Context for study:</b></u> This is the final unit of eight science units where pupils study animals, including humans, as part of the discipline of biology - the study of living organisms. Pupils have a secure knowledge of life cycles and what animals, including humans, need to survive. Pupils know that humans and some other animals have skeletons and muscles for support, protection and movement. Pupils know the functions of the basic parts of the digestive system and the functions of different types of teeth in humans. Previous learning includes the changes a human goes through as they develop across their lifetime. In SRE sessions, pupils learned how babies grow and develop, and about puberty. Pupils know what older people need to stay healthy and the difficulties they may face as a result of old age. This Year 6 unit builds on pupils’ knowledge of the importance of a healthy lifestyle, including a balanced diet and the effects of sugar, the different food groups and their role in human development. New learning includes recognising the impact of diet, exercise, drugs and lifestyle on the way their bodies function. In Year 6, pupils identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Pupils also describe the ways in which nutrients and water are transported within animals, including humans. This is the precursor to work studied in KS3 when pupils continue to study the human body as part of the discipline of biology.  <b>Working Scientifically:</b> Fair Testing: Explore is our heart rate always the same?		
<b>Heart:</b> Organ which pumps blood around the body. <b>Pulse (rate):</b> Your heart has to push so much blood through your body that you can feel a little thump in your arteries each time the heart beats <b>Pumps:</b> Regular contracting (squeezing) and relaxing, which pushes the blood at high pressure. <b>Blood:</b> A body fluid which contains platelets, red and while blood cells within plasma. Red blood cells carry oxygen. White blood cells are art of the body’s immune system. <b>Blood Vessels:</b> Blood vessels are a series of tubes inside your body. They move blood to and from your heart. <b>Lungs:</b> Organs designed to take oxygen from the air and deliver it into the blood stream. They also remove carbon dioxide from the blood and back into the air. <b>Oxygen:</b> A gas required by living things. <b>Drugs:</b> A drug is a chemical that is not food and that affects your body. Some drugs are given to people by doctors to make them healthy. <b>Carbon Dioxide:</b> A waste gas created through breathing (respiration). <b>Nutrients:</b> Vitamins and minerals needed to keep people healthy. <b>Muscles:</b> Tissues which are connected to other parts of the body (usually bones) which contract and relax, allowing us to move.			



**Circulatory System:** Also called the cardiovascular system, delivers nutrients and oxygen to all cells in the body.

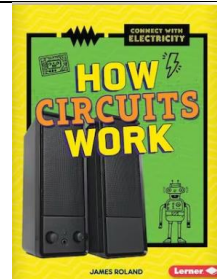
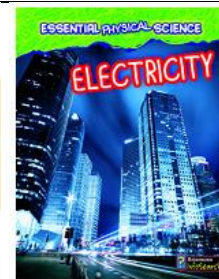
NC Objectives	Knowledge Content	Working Scientifically
<p><i>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</i></p> <p><i>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</i></p> <p><i>Describe the ways in which nutrients and water are transported within animals, including humans.</i></p> <p><i>Working scientifically:</i></p> <p><i>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</i></p> <p><i>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</i></p> <p><i>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.</i></p> <p><i>Using test results to make predictions to set up further comparative and fair tests.</i></p> <p><i>Reporting and presenting findings from enquiries, including conclusions, causal relationships</i></p>	<p><b>Circulatory System</b></p> <p>Know the circulatory system is the system that circulates blood through the body.</p> <p>Know that this consists of the heart, blood vessels, blood, veins, arteries, capillaries, oxygen, lungs and ribcage.</p> <p>Know the location of the lungs and heart</p> <p>Know that the heart is a hollow muscular organ that pumps the blood through the circulatory system by regular contractions. There are four chambers with two atria and two ventricles.</p> <p>Know the following sequence that explains the function of the heart:</p> <ol style="list-style-type: none"> <li>1. Deoxygenated blood flows into the heart from the body through the veins</li> <li>2. This blood is pumped out to the lungs through the pulmonary artery</li> <li>3. Blood is then oxygenated in the lungs</li> <li>4. Blood returns to the heart through the pulmonary vein</li> <li>5. The oxygenated blood is then pumped out of the heart through the aorta</li> <li>6. The blood travels around the body delivering oxygen and nutrients to the organs.</li> </ol> <p>Know that oxygenated means 'to be enriched with oxygen'</p> <p>Know that deoxygenated means 'to be depleted of oxygen'</p> <p>Know that blood is red when oxygenated and deep purple or blue looking through skin when not.</p> <p><b>Diet, exercise, drugs and lifestyle</b></p> <p>Know that diet can impact on lifestyle as fatty rich foods can clog arteries and veins, preventing blood from delivering what is needed.</p> <p>Know that exercise can improve the health of a person by removing fatty deposits from the body.</p> <p>Know that some exercises are called cardiovascular, and are designed to improve the fitness of the overall circulatory system by strengthening the organs and pulse rate.</p> <p>Know the impact of having little exercise and poor diet will have</p> <p>Know that taking certain drugs can cause permanent damage to the circulatory system (link to PSHE curriculum)</p>	<p>Take measurements of pulse rate before and after a range of exercises. Make predictions as to what will happen if measurements are taken at regular intervals. Repeat over time and record results in a line graph.</p>





*and explanations of and a 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.*

Term:	Y6- Autumn 2	Key Text(s):		
Scientist Study:	N/A			
Unit Title:	<h2>Physics: Electricity</h2> <p><b>Context for study:</b> This unit is the second of only two science units where pupils learn about electricity as part of the discipline of physics - the study of the processes that shape our world and how we use it. Pupils are able to identify common appliances that run on electricity. Pupils have a secure knowledge of simple series electrical circuits including that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. They know some common conductors and insulators, and associate metals with being good conductors. In Year 6, pupils learn about the scientists Benjamin Franklin and Thomas Edison and the key role they each played in the discovery of electricity. During this unit, pupils revise and build upon their previous knowledge of electrical circuits as they use recognised symbols when representing a simple circuit in a diagram. New learning includes associating the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Pupils 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.</p> <p><b>Working Scientifically:</b> Enquire: Is it possible to change how bright a bulb is?</p>			
<p><b>Electricity:</b> The flow of electrons through a conducting material.</p> <p><b>Series Circuit:</b> A series circuit is one that has more than one resistor, but only one path through which the electricity (electrons) flows.</p> <p><b>Complete Circuit:</b></p> <p><b>Cell / Battery:</b> An electrical cell is a device that is used to generate electricity, or one that is used to make chemical reactions possible by applying electricity.</p> <p><b>Circuit Diagram:</b></p> <p><b>Volts / Voltage:</b> Voltage is an electrical potential difference, the difference in electric potential between two places.</p> <p><b>Bulb:</b> A glass bulb which provides light by passing an electrical current through a filament.</p> <p><b>Switch:</b> A device for making and breaking the connection in an electric circuit.</p> <p><b>Buzzer:</b> An electrical device that makes a buzzing noise and is used for signalling.</p>				



**Motor:** A machine powered by electricity that supplies power for a vehicle or other moveable device.

**Electrical Symbols:** Standardised drawings which represent electrical components such as bulbs, motors and wires.

**Electrical Conductor:** Some materials let electricity pass through them easily. These materials are known as electrical conductors.

**Electrical Insulator:** Plastic, wood, glass and rubber are good electrical insulators.

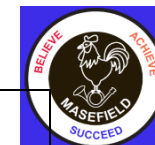
**Socket:** A socket is a safe device to plug your electrical items into at home. Almost every room at home will have at least one socket.

**Plug:** A device at the end of a power cord (wire) that connects to the socket.

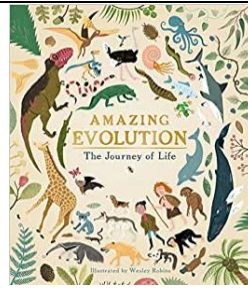
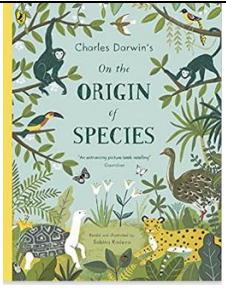
**Fuses:** These are safety devices. A fuse is a strip of wire that melts and breaks an electric circuit if it goes over a safe level.

**Component:** Part of a circuit, such as bulb, battery, switch, wire, buzzer

NC Objectives	Knowledge Content	Working Scientifically
<p><i>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</i></p> <p><i>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.</i></p> <p><i>Use recognised symbols when representing a simple circuit in a diagram.</i></p> <p><i>Working scientifically:</i></p> <p><i>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</i></p> <p><i>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</i></p> <p><i>Recording data and results of increasing complexity using</i></p>	<p>Know that electricity is created by generators which can be powered by gas, coal, oil, wind or solar.</p> <p>Know that the electrical energy can be converted into other types of energy such as light, heat, movement or sound. Electricity is dangerous, so be careful when using electrical appliances.</p> <p>Conductors and Insulators: Revision from Y4</p> <p>Know that some materials let electricity pass through them easily. These materials are known as electrical conductors.</p> <p>Know that many metals, such as copper, iron and steel, are good electrical conductors. That is why the parts of electrical objects that need to let electricity pass through are always made of metal.</p> <p>Know that metal is used in plugs to allow electricity to transfer from the wall socket, through the plug, and into a device such as a radio or TV.</p> <p>Know that some materials do not allow electricity to pass through them. These materials are known as electrical insulators.</p> <p>Know that plastic, wood, glass and rubber are good electrical insulators. That is why they are used to cover materials that carry electricity.</p> <p>Know that the plastic covering that surrounds wires is an electrical insulator. It stops you from getting an electrical shock.</p> <p>Circuits</p> <p>Know that electricity can flow through the components in a complete electrical circuit.</p> <p>Know that a circuit always needs a power source, such as a battery, with wires connected to both the positive (+) and negative (-) ends. A battery is made from a collection of cells connected together.</p>	<p>(Note - ensure children are confident with their understanding of how circuits work before designing circuits. Practical work then supports what they already know and is not used to teach knowledge) Draw and design circuits using the correct symbols then build them. Systematically identify the effect of changing one component at a time. Predict and test outcomes.</p>



<p><i>scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.</i></p> <p><i>Using test results to make predictions to set up further comparative and fair tests.</i></p> <p><i>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.</i></p> <p><i>Identifying scientific evidence that has been used to support or refute ideas or arguments.</i></p>	<p>Know that a circuit can also contain other electrical components, such as bulbs, buzzers or motors, which allow electricity to pass through.</p> <p>Know that electricity will only travel around a circuit that is complete. That means it has no gaps. You can use a switch in a circuit to create a gap in a circuit. This can be used to switch it on and off.</p> <p>Know that when a switch is open (off), there is a gap in the circuit. Electricity cannot travel around the circuit. When a switch is closed (on), it makes the circuit complete. Electricity can travel around the circuit.</p> <p>Know that a circuit always has a battery (cell) but it can also contain other electrical components, such as bulbs, buzzers and motors.</p> <p>Know that when drawing circuit diagrams, rather than drawing detailed components, we use simple symbols to represent the different components.</p> <p>Know which symbols to use when drawing a circuit</p> <p>Know that electricity flows through a circuit, with the volt being the push that moves electrons along the wires.</p> <p>Know that the more volts there are in a circuit, the more power there is travelling through it.</p> <p>Understand that the higher the volts, the brighter a lamp and the louder a buzzer</p>	
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Term:	Y6- Spring 1	Key Text(s):	 
Scientist Study:	<b>Charles Darwin (1809-1882)</b> English naturalist, geologist and scientist, who sailed to the Galapagos Islands on HMS Beagle. Whilst there, he developed his theories of natural selection and evolution.		
Unit Title:	<b>Biology: Evolution and Inheritance</b>  <u><b>Context for study:</b></u> This unit is the final of six science units where pupils learn about plants and animals as part of the discipline of biology- the study of living organisms. This unit comes after pupils have studied a variety of living things in their local and wider environment. Pupils know species of animals and plants from the Amazon rainforest, how they are adapted to suit their environment and that adaptation may lead to evolution. Pupils can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Pupils have secure knowledge of the seven life processes, the requirements of plants for life and growth and food chains. In this unit, pupils revise and further develop their knowledge of the functions of the different parts of flowering plants related to reproduction. In Year 6, pupils learn that sexual reproduction in plants happens in a cycle-like pattern: germination, pollination, fertilization and seed dispersal (Year 3 revision). This unit builds on pupils' previous knowledge of the classification of living things. In Year 6, pupils 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. Pupils learn about plant taxonomy- the science that finds, identifies, describes, classifies, and names plants. Pupils learn about the modern classification system created by Carl Linnaeus and that each species is given a name using Latin words which links to the Year 5/6 Latin curriculum. Pupils are introduced to the taxonomic hierarchy in relation to the red fox which is the precursor to work pupils will study in KS3. During this unit, pupils also learn about the important role bees play in pollination in our ecosystem, understand why the global bee population is in decline and the need for conservation to maintain bee populations for the future.  <b>Working Scientifically:</b> Explain: Why do species of animals look different?		



**Evolution:** Adaptation and change of living things over time.

**Offspring:** The young plant or animal that is produced by reproduction of the species. Example: children.

**Sexual Reproduction:** The process of reproduction using genetic material from both the male and female of the species.

**Variation:** The differences between individuals of the same species.

**Suited:** A change which enables a species to live well within its environment.

**Adaptation:** A genetic trait or characteristic which changes over time, increasing a species reproduction and survival chances.

**Inheritance:** A mixture of parental characteristics and traits that are passed on to their offspring.

**Environment:** An area containing many different habitats, where both living and non-living things exist.

**Characteristics:** The distinguishing features that all members of a species have.

**Species:** A type of living thing. Examples: oak trees, humans.

**Habitat:** The natural environment in which a living thing lives.

**Fossils:** The remains or imprint of a prehistoric plant or animal embedded within rock.

**Natural Selection:** The best adapted and fittest members of a species survive to breed, resulting in stronger, better adapted offspring.

**DNA:** The 'recipe' for how living things are made.

**Organism:** Living things. These can be plants, animals or microbes (bacteria etc.).

**Climate:** The weather conditions and temperature of a place.

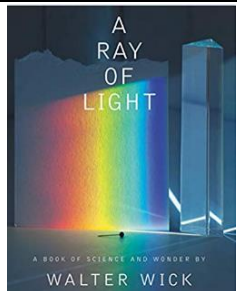
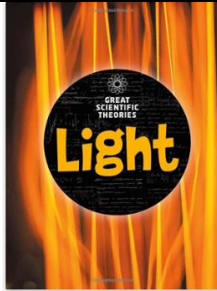
NC Objectives	Knowledge Content	Working Scientifically
<p><i>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</i></p> <p><i>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</i></p> <p><i>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</i></p> <p><i>Working scientifically:</i></p>	<p>Know that characteristics are passed from parents to their offspring.</p> <p>Use the example of different breeds of dog (including what happens when Labradors are crossed with poodles).</p> <p>Know that variation in offspring over time can make animals more or less able to survive in particular environments e.g. the development of insulating fur on the arctic fox.</p> <p>Charles Darwin</p> <p>Know that Darwin lived from 1809 - 1882 and is known for his theory of evolution Know that Darwin studied animals and plants (a biologist) and developed the idea of natural selection to explain how different species had evolved over time. Know that he explained his theory in his most famous book 'On The Origin of Species' Know that his theory was formulated whilst studying animals on the HMS Beagle voyage between 1831 and 1836 including the Galapagos islands.</p> <p>Know that in biology, an adaptation is defined as 'the process of change by which an organism or species becomes better suited to its environment.</p> <p>Know the case study of the peppered moths as described in Moth: An Evolution Story.</p>	<p>Know the story of Darwin's finches and how the shape of their beaks helped Darwin to develop his theories.</p> <p>Peppered Moths Case Study</p> <ol style="list-style-type: none"> <li>1. Light-coloured moths were common</li> <li>2. During the Industrial Revolution (1760 – 1840) coal burning covered the moth's habitats in black soot</li> <li>3. This gave the dark coloured moths a greater chance of survival because they had better camouflage than the light moths</li> </ol>



<p><i>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</i></p> <p><i>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</i></p> <p><i>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.</i></p> <p><i>Using test results to make predictions to set up further comparative and fair tests.</i></p> <p><i>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.</i></p> <p><i>Identifying scientific evidence that has been used to support or refute ideas or arguments.</i></p>	<p>Know that the theory of evolution states that evolution happens by natural selection through the following process:</p> <p>The Process of Evolution</p> <ol style="list-style-type: none"> <li>1. More organisms are born than can survive.</li> <li>2. These individuals all have slight variations between them.</li> <li>3. Some of these variations are helpful and improve an organism's chance of survival</li> <li>4. Those that survive pass their characteristics onto their offspring.</li> <li>5. Over time these helpful variations are passed on to the next generation.</li> <li>6. This process takes thousands of years and can't be seen from one generation to the next.</li> </ol> <p>Know the term inheritance as 'the passing on of characteristics from parent to offspring'</p> <p><a href="http://www.bbc.co.uk/timelines/zq8gcdm">http://www.bbc.co.uk/timelines/zq8gcdm</a></p> <p>Fossilisation</p> <p>Know that fossilisation is the process that forms fossils.</p> <p>Know that a fossil is 'the remains or impression of a prehistoric plant or animal embedded in rock and preserved in petrified form'</p> <p>Know that prehistoric means 'before written history'.</p> <p>Know that preserved means 'to keep something as it is'.</p> <p>Know that petrified means 'change into stone'</p> <p>Know that an ammonite (a-muh-nite) is a mollusc that lived in the sea over 65 million years ago.</p> <p>Know what an ammonite fossil looks like and identify them from images of fossils.</p> <p>Know these dinosaur names and identify from images - Tyrannosaurus Rex, Brachiosaurus, diplodocus, stegosaurus, triceratops, iguanodon, velociraptor.</p> <p>Know the term dinosaur comes from the Greek word deinos (terrible) and sauros (lizard) which, put together, makes 'terrible lizard.'</p> <p>Know that dinosaurs are actually reptiles not lizards.</p>	<p>4. Many light-coloured moths died as they were easily spotted by their prey</p> <p>5. Dark coloured moths became more common</p> <p>6. As pollution has reduced over time the light-coloured moths have now become more common again</p>
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Term:	Y6- Summer 1	Key Text(s):	 
Scientist Study:	N/A		
Unit Title:	<b>Physics: Light</b>  <b><u>Context for study:</u></b> This unit is the second of two science units where pupils learn about light as part of the discipline of physics - the study of the processes that shape our world and how we use it. Pupils have a secure knowledge of the terms opaque, transparent and translucent; what plants need, including light, to grow well and how energy from light is the start of a food chain. Previous learning includes knowing that light from the sun can be dangerous and that there are ways to protect their eyes. Pupils also know we need light in order to see things and that dark is the absence of light. This unit builds upon pupils’ prior knowledge that shadows form when the light from a light source is blocked by an opaque object. Pupils already know that light is reflected from surfaces and it can be separated into a prism of colours. New learning includes knowing how light appears to travel in straight lines. Pupils learn that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. This new knowledge acquired in Year 6 is used to explain why shadows have the same shape as the objects that cast them and that those objects are seen because they give out or reflect light into the eye. This is the precursor to work studied in KS3 as pupils continue to learn about how light can be reflected, refracted and dispersed as part of the discipline of physics.  <b><u>Working Scientifically:</u></b> Enquire: Why can I hear round corners but not see round corners?		
<b>Visible Light Rays:</b> One of the characteristics of light is that it behaves like a wave. Light can be defined by its wavelength and frequency. The frequency is how fast the wave vibrate up and down. <b>Primary Light Source:</b> Light, or illumination, is a form of energy that travels in waves, like sound from a source. Primary sources of light create the light itself, such as a candle or the Sun.			





**Secondary Light Source:** These sources of light do not create light, instead they reflect light from primary light sources. Examples: The Moon and mirrors.

**Dark / Darkness:** An absence of light.

**Transparent:** The property of materials which lets light pass through. The image is clear.

**Translucent:** The property of materials which lets some light pass through. The image is blurry.

**Opaque:** The property of materials which does not let light pass through.

**Shiny Surface:** Surfaces which reflect light.

**Matt Surface:** Surfaces which do not reflect light.

**Shadow:** An area of darkness formed when light cannot pass through opaque objects.

**Reflect:** Light waves bounce off of surfaces in straight lines.

**Straight Lines:** Light always travels in straight lines. It does not bend.

**Sunlight:** The light produced by our nearest star, the Sun.

**Dangerous:** Direct sunlight is very bright and can damage the retina of the eye, potentially causing blindness.

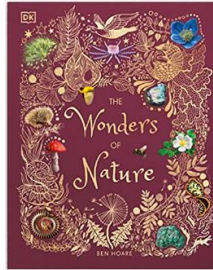

**Filters:** A filter is a transparent material that absorbs some colours and allows others to pass through.

NC Objectives	Knowledge Content	Working Scientifically
<p><i>Recognise that light appears to travel in straight lines</i></p> <p><i>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.</i></p> <p><i>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.</i></p> <p><i>Explain why shadows have the same shape as the objects that cast them.</i></p> <p><i>Working scientifically:</i></p> <p><i>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</i></p>	<p>Know that light travels in straight lines from its source.</p> <p>Know that some light sources are natural (stars, sun, fire, lightning, bioluminescence) and some are man-made (torch, light bulb, digital screen, laser pointer)</p> <p>Know that light either travels in a straight line directly from the source or by reflecting off a surface into our eye.</p> <p>Know how to draw arrows to show light entering the eye from a light source or reflection.</p> <p>Know that reflection is when light bounces off a surface, changing the direction of a ray of light.</p> <p>Know that all objects reflect light; smooth and shiny surfaces reflect all the rays of light at the same angle, rather than scattering the rays of light like rough or dull surfaces.</p> <p>Know that when rays of light reflect, they obey the law of reflection: The angle of incidence always equals the angle of reflection.</p> <p>Demonstrate with a laser pointer and mirror.</p> <p>Predict where the laser will point given a change in angle.</p> <p>Shadows</p> <p>Know that a shadow is formed when light is blocked by an opaque object.</p> <p>Know that opaque means light cannot pass through, translucent means some light can pass through but it is difficult to see through and that transparent means light can pass easily through and it is easy to see through.</p>	<p>Use sticks and mirrors to create simple periscopes that allow people to see what is happening behind or above them.</p> <p>Create labelled diagrams that show the path that the light took to reach the eye.</p>



<p><i>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</i></p> <p><i>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.</i></p> <p><i>Using test results to make predictions to set up further comparative and fair tests.</i></p> <p><i>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.</i></p> <p><i>Identifying scientific evidence that has been used to support or refute ideas or arguments.</i></p>	<p>Understand that as light travels in straight lines shadows have the same shape as the objects that cast them.</p> <p>Understand that if something casts a light or shadow somewhere, it causes it to appear there.</p> <p>Know that the further the light source from the opaque object the bigger the shadow.</p> <p>Know that the nearer the light source from the opaque object the smaller the shadow.</p> <p>Know that the shadow of an object can be moved by moving the light source.</p> <p>Know that a silhouette is different from a shadow because a silhouette is the solid dark shape that you see when someone or something has a bright light or pale background behind them.</p> <p><b>The Eye</b></p> <p>Know that the amount of light entering the eye is controlled by the pupil, which is surrounded by the iris – the coloured part of the eye.</p> <p>Know that the pupil dilates when it is darker to let more light into the eye.</p> <p>The pupil constricts when it is bright to reduce the amount light entering the eye.</p>	
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Term:	Y6- Summer 2	Key Text(s):	 
Scientist Study:	<b>Carl Linnaeus</b> (1707-1778) Swedish biologist who created the binomial naming system for living things. His work began to link together the ‘tree of life’, showing how species are related to one another.		
Unit Title:	<b>Biology: Living Things and their Habitats</b>  <b>Context for study:</b> This unit is the final of six science units where pupils learn about plants and animals as part of the discipline of biology- the study of living organisms. This unit comes after pupils have studied a variety of living things in their local and wider environment. Pupils know species of animals and plants from the Amazon rainforest, how they are adapted to suit their environment and that adaptation may lead to evolution. Pupils can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Pupils have secure knowledge of the seven life processes, the requirements of plants for life and growth and food chains. In this unit, pupils revise and further develop their knowledge of the functions of the different parts of flowering plants related to reproduction. In Year 6, pupils learn that sexual reproduction in plants happens in a cycle-like pattern: germination, pollination, fertilization and seed dispersal (Year 3 revision). This unit builds on pupils’ previous knowledge of the classification of living things. In Year 6, pupils 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. Pupils learn about plant taxonomy- the science that finds, identifies, describes, classifies, and names plants. Pupils learn about the modern classification system created by Carl Linnaeus and that each species is given a name using Latin words which links to the Year 5/6 Latin curriculum. Pupils are introduced to the taxonomic hierarchy in relation to the red fox which is the precursor to work pupils will study in KS3. During this unit, pupils also learn about the important role bees play in pollination in our ecosystem, understand why the global bee population is in decline and the need for conservation to maintain bee populations for the future.  <b>Working Scientifically:</b> Record: Classification		
<b>Vertebrates:</b> Animals which have backbones (mammals, fish, birds, reptiles and amphibians). <b>Fish:</b> Aquatic scaly animals whose limbs are fins and breathe using gills. Examples: sharks, goldfish.			



**Amphibians:** Vertebrates who lay eggs and spend at least some part of their life cycle living in water. They usually undergo metamorphosis. Examples: frogs, toads, newts.

**Reptiles:** Egg-laying, scaled animals who shed their skins. Examples: snakes, tortoises, lizards.

**Birds:** Egg-laying, warm-blooded, feathered animals with beaks. Most, but not all species can fly. Example: blackbird, robin, penguin.

**Mammals:** Fur-covered, warm-blooded animals who (mainly give birth to live young and lactate (produce milk). Examples: humans, dogs, whales, dolphins.

**Invertebrates:** Animals without backbones. These include insects, spiders (arachnids), worms and crustaceans such as crabs.

**Spiders:** (Arachnids) Eight-legged animals with exoskeletons and two body sections (head and abdomen). They cannot fly and often spin silk webs.

**Insects:** Six-legged, three body segmented creatures with exoskeletons.

**Snails:** Molluscs with shells. They move via a mucus (slime) covered muscular foot. They have hydrostatic skeletons.

**Worms:** Segmented, limbless animals with hydrostatic (water pressure) skeletons.

**Flowering Plants:** Plants which reproduce using pollination via flowers.

**Non-Flowering Plants:** Plants which reproduce using other means such as runners. They do not have flowers.

**Environment:** The place and its surroundings where living things live.

**Animals:** Multi-cellular living things which cannot create their own food and can move.

**Classify / Classification Key:** The process of using 'Yes' / 'No' answered questions to sort living things.

**Micro-organism:** Micro-organisms are tiny. They are so small they can only be seen with a microscope.

**Species:** This is the grouping together of similar species of plant, animal and other organisms.

**Fungi:** Fungi are a group of living organisms which are classified in their own kingdom. This means they are not animals, plants, or bacteria.

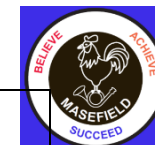
**Monera:** The whole organism is made up of just one cell. The cell is more basic than cells of other organisms.

**Bacteria:** Bacteria are tiny, single-celled organisms that are everywhere around us.

**Protista:** Protists are not animals, plants, fungi, or bacteria. Many protists are so small that people can see them only through a microscope.

**Plant:** Living things which are producers, using photosynthesis to create sugars

NC Objectives	Knowledge Content	Working Scientifically
<p><i>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</i></p> <p><i>Give reasons for classifying plants and animals based on specific characteristics.</i></p> <p><i>Working scientifically:</i></p>	<p>Know that plant taxonomy is the science that finds, identifies, describes, classifies, and names plants.</p> <p>Classifying organisms</p> <p>Know that there are millions of species of living things on our planet.</p> <p>Know that it would be difficult to describe and name each one individually.</p> <p>Know that while species can be very different from each other, many of them have similar features that allow us to put them into groups.</p> <p>Know that grouping things helps scientists identify gaps in their research and they get an idea of what to investigate next.</p> <p>Modern classification system</p>	



*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 graph.*

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

*Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.*

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

Know that, in 1735 (in the eighteenth century), Carl Linnaeus started the modern system of organising species of organisms into certain groups and giving them scientific names.

Carl Linnaeus (1707 - 1778)

Each species is given a name using Latin words, so that the same name can be used all over the world.

Know that Latin is the language which the ancient Romans used to speak and is used frequently in science for classifying animals

Know that the scientific name for modern human beings is 'homo sapiens'.

Know that homo means 'man' and sapiens means 'wise'.

Know that homo is the genus name and sapiens is the species name. Putting different species into different groups according to their features is called classification.

Know that a genus is a class of similar things, especially a group of animals or plants that includes several closely related species.

Know that a species is a class of plants or animals whose members have the same main characteristics and are able to breed with each other.

Know that plants can be classified into two groups - flowering and non-flowering.

Know that non-flowering plants can be divided into two groups:

1. those that reproduce with dust-like particles called spores.
2. those that use seeds to reproduce

Know the following plants by their appearance:

Flowering Plants	Non-flowering Plants
bluebell poppy rose dandelion daisy honeysuckle ivy snowdrop	ferns pine moss

Know that mushrooms and fungi are not plants - they belong to a separate classification of



living things called fungi.

Revise the parts of a plant and their function - roots, stem, leaves, flower. (see Y2)

Life cycle of a plant

Know that sexual reproduction in plants happens in a cycle-like pattern. Flowers come from seeds, and they create seeds too. All flowering plants go through the following life cycle:

1. Germination is the process by which a plant begins to grow from a seed. Roots form under the soil. The stem, leaves and flower emerge above the soil.
2. Pollen produced by a flower is carried by insects or blown by the wind to another flower. This process is called pollination.
3. When the pollen reaches another flower, it travels to the ovary where it fertilises the ovules (egg cells) to make seeds. This process is called fertilisation.
4. These seeds are scattered by animals or the wind. This process is called dispersal. Some of the seeds will grow into new plants.

Know the parts of a flower related to reproduction - stamen (male) consists of the anther and filament.

The carpel (female) consists of the stigma, style, ovule and ovary.

Know how to label these on a diagram of a flower.

Seed dispersal (Revision from Y3)

<https://www.bbc.com/education/clips/znvfb9q>

Importance of bees

<http://www.bbc.co.uk/guides/zg4dwmn>

Know that bees play an important role in pollination.

Know that the global bee population is in decline because of pesticides, parasites, disease and habitat loss

Know that without bees our ecosystem would struggle because fewer plants would be pollinated and therefore fewer plants would grow.

Know that bee conservation is important to maintain bee populations for the future.

Know that conservation is 'saving and protecting the environment'

Know different ways to encourage bees into gardens.

Know that there are many species of bees recorded in the UK.

Recognise the difference between bumblebees and honey bees



	Know that bees can sting and many die after stinging as the sting is barbed and sticks in the skin. This means a large part of the bee is left behind after it has stung causing its death.	
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