



# Science Curriculum

## EYFS – Year 6

The primary intent for our curriculum:

- **To develop and ignite children’s curiosity and questioning.**
- To give children confidence to explore and discover the world around them so that they develop a deeper understanding of the world in which they live.
- Practical and enjoyable science curriculum to inspire and excite our children and foster a thirst for knowledge.
- Understand that ‘working scientifically’ is at the heart of science and this rich and varied science curriculum gives the children opportunities to investigate and ask questions.
- Dual objective planning ensures that skills and knowledge are delivered side by side.
- Understand that scientific knowledge is usually factual, not an opinion

The primary intent for our EYFS curriculum.

- To become an ‘Intrepid Explorer’ who knows how to read a simple map, knows their family tree, shows care to living creatures and understands some differences between their country and other countries across the world.

## Science Curriculum

	Autumn	Spring	Summer	ELGs
Nursery	<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>- 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> </ul> <p>Talk about the differences between materials and changes they notice.</p> <p><b>Seasonal changes and daily weather</b></p>	<ul style="list-style-type: none"> <li>- Talk about what they see, using a wide vocabulary.</li> <li>- Explore how things work.</li> <li>- Plant seeds and care for growing plants.</li> <li>- Begin to understand the need to respect and care for the natural environment and all living things.</li> </ul> <p><b>Seasonal changes and daily weather</b></p>	<ul style="list-style-type: none"> <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> </ul> <p><b>Seasonal changes and daily weather</b></p>	
Reception	<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>- Understand the effect of changing seasons on the natural world around them.</li> </ul>			<p>ELGs</p> <p><u>Natural World</u></p> <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>

## Science Curriculum

### Mixed classes in Y1/2 and Y5/6

	1	2	3	4	5
Year 1/2 Cycle A	Everyday Materials Y1 and Y2 * See MTP	Forces *	Animals Including Humans Seasonal changes (across the year) Working Scientifically	Plants Y1 and Y2 * See MTP	Light
Year 1/2 Cycle B	Living things and their habitats	Everyday materials Y1 and Y2 * See MTP	Animals including humans (2) Working Scientifically	Plants Y1 and Y2 * See MTP	Electricity
Year 3	Animals including humans	Rocks	Forces and magnets Working Scientifically	Light	Plants
Year 4	Living things and their habitats	Animals including humans	Electricity Working Scientifically	States of matter	Sound
Year 5/6 Cycle A	Animals including humans (Y5)	Properties and changes of materials	Forces Working Scientifically	Earth and Space	Animals including humans Y6
Year 5/6 Cycle B	Living things and their habitats (Y5)	Evolution and inheritance	Electricity Working Scientifically	Living things and their habitats (Y6)	Light

### 2023-2024 Plan \*(Y5/6 to teach separately for the first unit of work year and then resume the cycle B )

Year 5	Living things and their habitats (Y5)	Evolution and inheritance	Electricity	Living things and their habitats	Light
Year 6	Animals including humans (Y6)	Evolution and inheritance	Electricity	Living things and their habitats	Light

# SLS/HHA Primary Science Curriculum Overview

- Explaining Science
- Classification
- Designing Experiments
- Data, Tables & Graphs
- Making Conclusions



Particle Model



Force Arrow Model



Energy Transfer Model



Big Picture Model



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	1	2	3	4	5
Year 1	<b>Everyday Materials</b> <ul style="list-style-type: none"> <li>Describe the materials that a range of objects are made from.</li> <li>Describe simple physical properties of a variety of everyday materials.</li> <li>Compare &amp; group a variety of everyday materials using their physical properties.</li> </ul>	<b>Pushes &amp; Pulls</b> <ul style="list-style-type: none"> <li>Recognise &amp; name a push and a pull force in action.</li> <li>Know that a force is needed to move an object.</li> <li>Explore &amp; investigate that a bigger force is needed to move an object further.</li> <li>A bigger force is needed to move a heavier object.</li> <li>Force can be bigger / smaller &amp; moves an object in a direction.</li> </ul>	<b>Animals Including Humans</b> <ul style="list-style-type: none"> <li>Identify, name, describe features of and compare common vertebrates.</li> <li>Identify &amp; name common carnivores, herbivores &amp; omnivores.</li> <li>Identify, name, draw &amp; label basic human body part.</li> <li>Know the five senses and link these to human body parts.</li> </ul> <b>Seasonal Changes</b> <ul style="list-style-type: none"> <li>Observe &amp; describe changes across the four seasons.</li> <li>Observe, describe, measure &amp; record weather across the four seasons.</li> <li>Observe the sun moving across the sky. Describe changes in day-length across the seasons (see Light &amp; Shadows).</li> </ul>	<b>Plants</b> <ul style="list-style-type: none"> <li>Identify &amp; describe the basic structure of flowering plants.</li> <li>Identify, name &amp; observe a variety of common plants (garden/wild/veg plants, trees) growing in their habitat.</li> <li>Identify deciduous &amp; evergreen trees.</li> </ul>	<b>Light &amp; Shadows</b> <ul style="list-style-type: none"> <li>Identify a range of light sources (natural &amp; man-made).</li> <li>Observe &amp; describe light coming from a light source. Observe &amp; describe brightness close to and further away from a light source.</li> <li>Observe how materials behave with light.</li> <li>Describe how a shadow forms.</li> <li>Know how to stay safe in the bright sunlight and in the dark.</li> </ul>
Year 2	<b>Living Things &amp; Habitats</b> <ul style="list-style-type: none"> <li>Know the differences between things that are living, dead and those that have never been alive.</li> <li>Describe how habitats give a place for animals and plants to live, grow and feed. Living things are suited to their habitat (microhabitat).</li> <li>Identify &amp; name animals &amp; plants.</li> <li>Describe food chains. Identify and name sources of food.</li> </ul>	<b>Uses of Everyday Materials</b> <ul style="list-style-type: none"> <li>Can describe the properties of a range of everyday materials.</li> <li>The uses (application) of a variety of everyday materials.</li> <li>There are three states of matter. Know the properties of solids, liquids and gases.</li> <li>The shape of solid objects can be changed by squashing, bending, twisting and stretching.</li> </ul>	<b>Animals Including Humans</b> <ul style="list-style-type: none"> <li>Animals (including humans) have offspring which grow into adults. Compare to other animal life cycles.</li> <li>Animals need water, food and air (oxygen) to survive.</li> <li>It is important to exercise, eat the right amounts of different types of food and to keep ourselves clean (hygiene).</li> </ul>	<b>Plants</b> <ul style="list-style-type: none"> <li>Know and describe the stages as seeds (&amp; bulbs) grow into mature plants (life cycle of a flowering plant).</li> <li>Know that plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>	<b>Building Circuits</b> <ul style="list-style-type: none"> <li>Know appliances that need electricity (power/energy source) to work (mains, battery, rechargeable, etc).</li> <li>Can name (with their symbol) and use components correctly/safely in simple circuit.</li> <li>Can build simple closed series circuits from instructions.</li> <li>Can identify dangers &amp; know how to use electricity safely in the home/classroom.</li> </ul>
	Working Scientifically				
Year 3	<b>Animals Including Humans</b> <ul style="list-style-type: none"> <li>Animals (including humans) need the right types and amounts of food (nutrition). Unlike plants, animals can't make their own food – they need to transfer energy in through food.</li> <li>Humans (and some other animals) have skeletons and muscles for support, protection and movement.</li> </ul>	<b>Rocks</b> <ul style="list-style-type: none"> <li>Identify &amp; describe different kinds of rocks using appearance and physical properties. Rocks have lots of uses.</li> <li>Fossils are formed when things that have lived are trapped within rock over millions of years.</li> <li>Soils are made from rocks and organic matter.</li> </ul>	<b>Forces and Magnets</b> <ul style="list-style-type: none"> <li>Some forces need contact (contact forces) between two objects and some forces act at a distance (non-contact forces).</li> <li>Magnets attract or repel each other. Magnets have two poles.</li> <li>Materials can be grouped together based upon whether they are attracted to a magnet (magnetic) or not.</li> </ul>	<b>Light</b> <ul style="list-style-type: none"> <li>We need light to see things. Dark is the absence of light.</li> <li>Light from the sun can be dangerous. We protect our eyes.</li> <li>Light can be reflected from surfaces.</li> <li>Shadows are formed when light energy is blocked by an opaque object.</li> <li>Know how to change the size of a shadow.</li> </ul>	<b>Plants</b> <ul style="list-style-type: none"> <li>Identify/describe the functions of parts of flowering plants (flower in detail).</li> <li>Plants need air, light, water, nutrients from soil, and room to grow.</li> <li>Water is moved within plants from the roots to the leaves.</li> <li>Flowers support reproduction through pollination, seed formation &amp; seed dispersal.</li> </ul>
	Working Scientifically				

# Science Curriculum

Year 4	<p><b>Living Things &amp; Habitats</b></p> <ul style="list-style-type: none"> <li>Living things can be grouped in a variety of ways.</li> <li>Use classification keys to group, identify and name living things in local habitats.</li> <li>Know how to randomly sample a habitat for species diversity (biodiversity). Measure species richness &amp; abundance.</li> <li>Environments can change and this can pose dangers to living things. Conservation acts to save species and restore habitats.</li> <li>Learn how to change a habitat to encourage biodiversity.</li> </ul>	<p><b>Animals Including Humans</b></p> <ul style="list-style-type: none"> <li>Know the basic functions of parts of the digestive system in humans.</li> <li>Identify different types of teeth and describe their functions.</li> <li>Construct and interpret food chains. Identify producers (of energy), consumers (of energy), predators &amp; prey.</li> </ul>	<p><b>Electricity</b></p> <ul style="list-style-type: none"> <li>Recognise common appliances that run on electricity.</li> <li>Construct a range of simple closed series circuits. Draw these circuits with correct component symbols (named).</li> <li>Recognise and solve 'errors' in circuits to make them work.</li> <li>A switch opens and closes a circuit.</li> <li>Conductors allow electrical (energy) to pass through them. Insulators do not allow electrical (energy) to pass through.</li> </ul>	<p><b>States of Matter</b></p> <ul style="list-style-type: none"> <li>Groups materials as solids, liquids or gases. Know the features (criteria) that make them different.</li> <li>Can describe, using the particle model, how substances change from a gas, into a liquid, then into a solid (and back again) as they are heated or cooled.</li> <li>Temperature (°C) affects the speed (rate) of evaporation.</li> <li>Describe the water cycle (evaporation and condensation).</li> </ul>	<p><b>Sound</b></p> <ul style="list-style-type: none"> <li>Identify how sounds are made (sound energy, vibrations)</li> <li>Sound energy/vibrations travel from a source, through a medium (solid, liquid or gas), to your ear.</li> <li>The volume of a sound is linked to the strength of vibrations (sound energy) that produces it.</li> <li>The distance away from the source affects the volume of sound.</li> <li>The pitch of a sound is linked to the frequency of vibrations (sound energy) that produces it.</li> </ul>
Working Scientifically					
Year 5	<p><b>Living Things</b></p> <ul style="list-style-type: none"> <li>Describe similarity/differences in the life cycles of mammals, amphibians, birds and insects. Compare &amp; contrast.</li> <li>Research life cycles of plants, invertebrates &amp; vertebrates within local habitats. Be able to identify &amp; describe changes over time.</li> <li>Describe the life process of reproduction in plants &amp; animals. Sexual &amp; asexual.</li> </ul>	<p><b>Properties &amp; Changes of Materials</b></p> <ul style="list-style-type: none"> <li>Compare and Group materials based on their properties. Give reasons (from evidence) for uses of these materials.</li> <li>A mixture is made up of 2 or more substances (particles mix). A solute (solid) dissolves in a solvent (liquid) to form a solution.</li> <li>A solution and other mixtures can be separated through evaporating, filtering, sieving and chromatography.</li> <li>Dissolving, mixing and changes in state are reversible changes.</li> <li>Some changes form new materials (compounds) through chemical reactions. These are irreversible reactions.</li> </ul>	<p><b>Forces</b></p> <ul style="list-style-type: none"> <li>Opposing forces can be in balance or unbalanced.</li> <li>Unsupported objects fall towards earth because of gravity force acting between earth and the falling object.</li> <li>Air resistance force (gas) water resistance force (liquid) and friction force (solid) act between moving surfaces.</li> <li>Lever, pulleys and gears allow a smaller force to have a greater effect (force multipliers).</li> </ul>	<p><b>Earth &amp; Space</b></p> <ul style="list-style-type: none"> <li>The sun, planets and moon(s) are spherical bodies. Can describe the development of a heliocentric model of the solar system.</li> <li>Know the order of planets in our solar system. Can describe how planets rotate and orbit the sun.</li> <li>The Earth and other planets orbit the sun in the Solar System. Day and night are caused by the Earth's rotation (sun appears to move across the sky).</li> <li>The moon orbits the Earth. Know the phases of the moon.</li> </ul>	<p><b>Animals Including Humans</b></p> <ul style="list-style-type: none"> <li>Order and compare the stages in the human life cycle.</li> <li>Understand and describe the changes as humans develop to old age.</li> <li>Describe the changes experienced in puberty. Understand why puberty happens.</li> <li>Compare gestation time in animals.</li> </ul>
Working Scientifically					
Year 6	<p><b>Animals Including Humans</b></p> <ul style="list-style-type: none"> <li>Name the main parts of the human circulatory system. Describe the functions of the heart (structure), blood vessels (artery, vein &amp; capillaries) &amp; blood (components)</li> <li>Understand &amp; describe the double circulatory system of humans to describe the way water, nutrients &amp; oxygen are transported in animals.</li> <li>Know the impact of diet, exercise, drugs &amp; lifestyle on the way our bodies function.</li> </ul>	<p><b>Evolution and Inheritance</b></p> <ul style="list-style-type: none"> <li>Living things can produce identical offspring (asexual) but sexual reproduction results in offspring that, although share inherited features, may vary (not identical) from their parents. Know some inherited features.</li> <li>This variation means that some individuals will have features better suited to a changing environment. These better features will be selected for by nature, and so, individuals that have them are more likely to survive.</li> <li>Natural selection is the process where species adapt to their environment. It is the engine that drives evolution. Know how some species are adapted.</li> <li>Fossil evidence shows how living things have changed over time.</li> </ul>	<p><b>Electricity</b></p> <ul style="list-style-type: none"> <li>Confidently draw a range of series circuits using symbols.</li> <li>Link the brightness of a bulb / volume of a buzzer to the number &amp; Voltage of cells used in the battery. Measure Voltage.</li> <li>Explain changes in brightness / volume using the Energy Transfer Model (link to Voltage). Explain the action of a switch.</li> <li>Begin to explain component 'failure' by resistance to electrical flow (energy transfer out of the circuit as heat energy). Begin to describe electrical flow as Current.</li> </ul>	<p><b>Living Things &amp; Habitats</b></p> <ul style="list-style-type: none"> <li>Living things are classified into broad groups according to observable features (binomial naming system). Reasons for classifying.</li> <li>There are five Kingdoms of living things. Know the binomial naming System. Can use &amp; construct classification Keys.</li> <li>Know how to sample a habitat for species diversity (biodiversity). Measure species richness, abundance &amp; evenness. Measure abiotic factors over time. Manage/plan change to encourage biodiversity.</li> <li>Micro-organisms include bacteria and fungi.</li> </ul>	<p><b>Light</b></p> <ul style="list-style-type: none"> <li>Light travels in straight lines from a light source (Energy Transfer Model) directly, reflects, goes through a material or is absorbed.</li> <li>Light travels in straight lines from a light source directly into the eye (represent this using a light ray diagram)</li> <li>Light travels in straight lines from a light source to an object and reflected into the eye (represent using a light ray diagram)</li> <li>Know the angle of incidence is equal to the angle of reflection.</li> <li>Explain the size and shape of a shadow knowing that light travels in straight lines (represent using a light ray diagram)</li> </ul>
Working Scientifically					

Year Group	 <b>Key Scientists</b>					
1	<b>Everyday Materials</b>  <b>Stephanie Kwolek</b> Invented Lycra and Kevlar	<b>Pushes and Pulls (Forces)</b>  <b>Isaac Newton</b> Gravity	<b>Animals Including Humans</b>  <b>Eugenie Clark</b> 'Trained' sharks.	<b>Plants</b>  <b>Richard Deverell</b> Director of Royal Botanic Gardens	<b>Light and Shadows</b>  <b>Thomas Edison</b> Invented the incandescent electric light bulb	<b>Seasonal Change (across the year)</b>  <b>John Dalton</b> Early weather pioneer
2	<b>Living Things and their habitats</b>  <b>David Attenborough</b> Scientist and broadcaster - animals	<b>Uses of Everyday Materials</b>  <b>John Dunlop</b> Developed first rubber inflatable tyre	<b>Animals including Humans</b>  <b>Dr Kelly Blacklock</b> Veterinary Surgeon	<b>Plants</b>  <b>George Washington Carver</b> Professor of Agriculture	<b>Electricity</b>  <b>Stanley Whittingham</b> Invented the rechargeable Lithium-ion battery	
3	<b>Animals including humans</b>  <b>Doris Howes</b> Research helped reduce malnutrition	<b>Rocks</b>  <b>Barnum Brown</b> Fossil hunter	<b>Forces and Magnets</b>  <b>William Gilbert</b> Magnetism	<b>Light</b>  <b>Ibn-alHaytham</b> Light and vision	<b>Plants</b>  <b>Janaki Ammal</b> Environmental activist	
4	<b>Living things and their Habitat</b>  <b>Thomas Lovejoy</b> Conservationist and policy advisor	<b>Animals including Humans</b>  <b>Marie Maynard Daly</b> Digestive enzymes and DNA	<b>Electricity</b>  <b>James Clerk Maxwell</b> Radio, television and radar	<b>States of Matter</b>  <b>Democritus</b> Matter	<b>Sound</b>  <b>Alexander Graham Bell</b> Telephone	
5	<b>Living things and Life Cycles</b>  <b>Maria Sybilla Merian</b> First to observe metamorphosis in silk worms	<b>Properties and Changes of Materials</b>  <b>Spencer Silver</b> Inventor of low tack glue – post its	<b>Forces</b>  <b>Galileo Galilei</b> Speed/mass/gravity	<b>Earth and Space</b>  <b>Stephen Hawkins</b> Studied black holes	<b>Animals Including Humans</b>  <b>David Sinclair</b> Leading scientist on human ageing	
6	<b>Animals Including Humans</b>  <b>William Harvey</b> Heart dissection	<b>Evolution and Adaptation</b>  <b>Alfred Russel Wallace</b> Evolution	<b>Electricity</b>  <b>George Ohm</b> Discovered relationship between voltage, current and resistance	<b>Living Things and their Habitats</b>  <b>Carl Linnaeus</b> Plant classification	<b>Light</b>  <b>Albert Einstein</b> Light - Photon	

Science Curriculum

Nursery	Autumn	Cycle 1 – We're going on a bear hunt, Peace at last, Goldilocks and the three bears, Dear Santa Cycle 2 - The tiger who came to tea, The three little pigs, room on the broom, Kipper's Christmas Eve	
What will be taught ... key ideas?		I wonder ..	Key vocabulary
<p>To use our senses to explore materials</p> <p>To use vocabulary to describe and sort materials</p> <p>To learn new vocabulary about the outside environment, seasons, weather etc</p> <p>To plant bulbs.</p> <p>To discuss the changes from Summer to Autumn and Autumn to Winter.</p> <p>To experience melting e.g. chocolate, ice</p> <p>To understand that a push force can make something move e.g. pushing a pram, pushing a pedal</p>		<p>I wonder who lives there?</p> <p>I wonder how you get there?</p> <p>I wonder what it looks/tastes/sounds/feels like...?</p> <p>I wonder what happens if...?</p> <p>I wonder who it is...?</p> <p>I wonder how it's made...?</p> <p>I wonder how many?</p> <p>I wonder why/how/who?</p>	<p>Senses</p> <p>Materials</p> <p>Hard</p> <p>Soft</p> <p>Bumpy</p> <p>Smooth</p> <p>Spiky</p> <p>Rough</p> <p>Autumn</p> <p>Spring</p> <p>Summer</p> <p>Winter</p> <p>Seasons</p> <p>Weather vocabulary</p> <p>Bulbs</p> <p>Planting</p> <p>Growing</p> <p>Change</p> <p>Melting</p> <p>Push</p> <p>Movement</p> <p>Force</p>

Science Curriculum

Nursery	Spring	Cycle 1 – The gingerbread man, Kitchen disco, Cleversticks, Sharing a shell Cycle 2 – Elmer, Rosie’s walk, Bathroom boogie,	
What will be taught ... key ideas?		I wonder ..	Key vocabulary
To begin to learn the names of adult and baby animals		I wonder who lives there?	Farm and pet animal names (adult and baby)
To learn new vocabulary about the outside environment, seasons, weather etc		I wonder how you get there?	Winter
To discuss the changes from Winter to Spring		I wonder what it looks/tastes/sounds/feels like...?	Seasons
To plant seeds		I wonder what happens if...?	Weather vocabulary
To know how to care for plants e.g. bulbs from Autumn, herbs		I wonder who it is...?	Autumn
To explore how things work e.g. water wheels, ramps, bikes, wind up toys		I wonder how it’s made...?	Spring
		I wonder how many?	Summer
		I wonder why/how/who?	Seeds
			Planting
			Growing

Nursery	Summer	Cycle 1 – Peepo, Whatever next, the selfish crocodile, the very hungry caterpillar Cycle 2 – Walking through the jungle, Jack and the beanstalk, Owl babies, Farmyard hullabaloo	
What will be taught ... key ideas?		I wonder ..	Key vocabulary
To continue to learn the names of adult and baby animals		I wonder who lives there?	Farm and pet animal names (adult and baby)
To learn new vocabulary about the outside environment, seasons, weather etc		I wonder how you get there?	Weather vocabulary
To discuss the changes from Spring to Summer		I wonder what it looks/tastes/sounds/feels like...?	Seeds
To care for the plants that we have nurtured from seed.		I wonder what happens if...?	Autumn
To discuss the life cycles of different plants and animals e.g owls, butterflies		I wonder who it is...?	Spring
		I wonder how it’s made...?	Summer
		I wonder how many?	Winter
		I wonder why/how/who?	Seasons
			Planting
			Growing



Science Curriculum


Reception	Autumn	Superworm, The enormous turnip, Gruffalo, Stick Man, Lost and found	
What will be taught ... key ideas?		I wonder ..	Key vocabulary
To draw a picture of themselves.		I wonder who lives there?	Soil
To build a wormery.		I wonder how you get there?	Worm
To learn about worms and where they live.		I wonder what it looks/tastes/sounds/feels like...?	Sand
Identify different vegetables.		I wonder what happens if...?	Rotten
To understand the term pull.		I wonder who it is...?	Vegetables
To plant grass seeds.		I wonder how it's made...?	Pour
To go on an autumn walk at different points across the season.		I wonder how many?	Water
To know they have a skeleton.		I wonder why/how/who?	Slither
To create homes for a fictional character			Trail
To know the names of woodland animals.			Hard
To learn about and have the life cycle of an owl and fox in the investigation area.			Soft
To understand floating and sinking linked to stick man.			Bone
To discuss the changes from Autumn to winter.			Skeleton
To explore and investigate freezing and melting.			Joint
To know how to take care of teeth.			Round
To identify polar animals and their habitats.			Rough
To look at different types of weather.			Smooth
To experience melting e.g. chocolate, ice			Bumpy
			Pull
			Seed
			Grass
			Shoot
			Roots
			Grow
			Pot
			Light
			Fox
			Snake
			Mouse
			Owl
			Wood
			Trees
			Underground
			Leaves
			Life
			Life cycle
			Float
			Sink
			Winter
			Season
			Teeth
			Polar
			Weather
			Sunny
			Cold
			Snow
			Rain
			Penquin

Science Curriculum


Reception	Spring	Mixed, Once there were giants, Three billy goats gruff, Little red hen, Zog	
What will be taught ... key ideas?		I wonder ..	Key vocabulary
To discuss families.		I wonder who lives there?	Mum                      Baby
To go on a Spring walk at different points across the season.		I wonder how you get there?	Dad                      Toddler
To make pancakes and discuss the change of state.		I wonder what it looks/tastes/sounds/feels like...?	Nan                      Teenager
To collect data on favourite colours and complete a tally chart as a class.		I wonder what happens if...?	Grandad              Adult
To make a sprinkle colour cake discussing food hygiene		I wonder who it is...?	Grandma              Child
To discuss the human life cycle from baby to older age.		I wonder how it's made...?	Uncle                   Giant
To teach the basics of a food chain through 'the hole in the bottom of sea.'		I wonder how many?	Aunty
Plant sunflower seeds		I wonder why/how/who?	Cake
			Bake
			Oven
			Cook
			Hygiene
			Heat
			Hot mix
			Stir
			Time
			Beat
			Crack
			Sunflower
			Seed


Reception	Summer	The little red hen, Monkey puzzle, Handa's Hen, What the ladybird heard, Commotion in the ocean.	
What will be taught ... key ideas?		I wonder ..	Key vocabulary
<p>To go on a Summer walk at different points across the season.</p> <p>To talk about the Earth and how to look after it. (Earth day)</p> <p>To bake bread</p> <p>To use the 5 senses to explore and investigate different types of bread</p> <p>To discuss the life cycle of a chicken and an egg.</p> <p>To be able to name farm animals and their babies.</p> <p>To understand day and night.</p> <p>Learn about the life cycle of a plant, through planting and observing our sunflower seeds.</p> <p>To discuss the ocean habitat and the creatures that live there.</p> <p>To know what pollution is and how to help the environment.</p> <p>To understand what can and can't be recycled.</p> <p>To create an egg carton ocean habitat.</p>	<p>I wonder who lives there?</p> <p>I wonder how you get there?</p> <p>I wonder what it looks/tastes/sounds/feels like...?</p> <p>I wonder what happens if...?</p> <p>I wonder who it is...?</p> <p>I wonder how it's made...?</p> <p>I wonder how many?</p> <p>I wonder why/how/who?</p>	<p>Summer</p> <p>Sun</p> <p>Hot</p> <p>Bread</p> <p>Flour</p> <p>Wheat</p> <p>Water</p> <p>Yeast</p> <p>Knead</p> <p>Rise</p> <p>Bake</p> <p>Cow and calf</p> <p>Sheep and lamb</p> <p>Hens, Rooster and chick</p> <p>Duck and ducklings</p> <p>Geese and gosling</p> <p>Cat and kitten</p> <p>Pig and piglet</p> <p>Dog and puppy</p> <p>Horse and foal</p> <p>Leaves</p>	<p>Pond</p> <p>Tractor and trailer</p> <p>Barn</p> <p>Farmhouse</p> <p>Stables</p> <p>Pens</p> <p>Vegetable Patch</p> <p>Wheelbarrow</p> <p>Meadow</p> <p>Day</p> <p>Night</p> <p>Light</p> <p>Dark</p> <p>Rabbit and kitten</p> <p>Farm</p> <p>Stalk</p> <p>Sunflower</p> <p>Root</p> <p>Stem</p> <p>Petal</p> <p>Pollution</p> <p>Recycling</p> <p>Environment</p> <p>Ocean</p>


EYFS STEM Projects		
	Nursery	Reception
Autumn	Building Brick Rainbows	Boat size and strength testing
Spring	Gingerbread Man Boat	Billy Goats Gruff Bridge Building
Summer	Jack & The Beanstalk Build a Castle in the Clouds	Gingerbread Man Trap (What the ladybird heard characters instead of GBM)

Everyday Materials		Term: 1	Year: 1/2 Cycle A
<p><b>Foundations of previous learning:</b> Looks closely at similarities, differences, patterns and change in nature. Talks about why things happen and how things work. Uses everyday (&amp; natural) materials. Explores the natural world around them by making observations. Understand processes and changes, including states of matter. Makes objects from different materials. Observes, measures and record how materials change over time and in different conditions. (EYFS)</p>			
<b>Unit Learning</b>			
NC Objective - Coverage	Skills		Vocabulary
<p><b>Year 1</b> Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock</p> <p>Describe simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties</p> <p><b>Year 2</b> Identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard.</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><b>Year 1</b></p> <p>I use &amp; remember science words during an activity</p> <p>I remember simple science facts within a topic</p> <p>I add science word labels to diagrams</p> <p><b>Year 2</b></p> <p>I use &amp; remember science words over a short time</p> <p>I remember a range of science facts within a topic</p> <p>I add science labels &amp; information (help) to diagrams</p>	<p><b>Year 1</b></p> <p>I group by difference or similarity</p> <p>I link properties of materials to an application (help)</p> <p><b>Year 2</b></p> <p>I group by difference similarity or change</p> <p>I link properties of materials to an application</p>	<p>Object, material</p> <p>Ice</p> <p>Wood Property</p> <p>Metal Rigid</p> <p>Plastic Flexible</p> <p>Wool Hard</p> <p>Cotton soft</p> <p>Nylon waterproof</p> <p>Paper absorbent</p> <p>Cork warm</p> <p>Glass cold</p> <p>Rock rough</p> <p>Fabric smooth</p> <p>Ceramic dull</p> <p>Rope shiny</p> <p>Concrete opaque</p> <p>Brick transparent</p> <p>Rubber sort</p> <p>Sponge group</p> <p>Elastic classify</p> <p>Foil criteria.</p>
Key Scientist	Assessment of Skills		Assessment of Knowledge
<p><b>Stephanie Kwolek</b> (1923-2014) Polish-American scientist who invented Lycra in 1958 and Kevlar in 1966 whilst also working at DuPont. Kevlar is 5 times stronger than steel and is used in tennis rackets, parachute lines and bullet-proof vests.</p> 	<p>Explaining science Classification (See SLS Assessment boards)</p>		<p><b>Year 1</b> Know the materials which objects are made from. Know and be able to use properties rigid, flexible, hard, soft and waterproof.</p> <p><b>Year 2</b> Know that you can change the shape of an object by squashing, bending, twisting and stretching Know materials can make different objects (e.g. metal – coins, cars, cans); the same object can be made from different materials (e.g. spoon – plastic, metal, wood).</p>

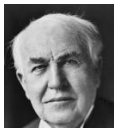
Science Curriculum


<b>Forces *</b>		<b>Term: 2</b>	<b>Year: 1/2 Cycle A</b>																																		
<b>Foundations of previous learning:</b> Considers & manages some risks by taking independent action or by giving a verbal warning to others. Talks about why things happen & how things work. Explores the natural world around them, making observations. Explores how objects/materials are affected by forces. (EYFS) Can name and describe a range of materials; links material to property (e.g. rigid, flexible, elastic, etc) (Materials Yr1)																																					
<b>Unit Learning</b>																																					
<b>*NC Objective - Coverage</b>	<b>Skills</b>	<b>Knowledge</b>	<b>Vocabulary</b>																																		
Recognise a push or a pull as a force needed to move an object.  Recognise that a force can be bigger or smaller and acts in a particular direction.  Explore how to push objects further with more force.  Explore how to push/pull heavier objects with more force.	<table border="0"> <tr> <td><b>Year 1</b></td> <td><b>Year 1</b></td> </tr> <tr> <td>I use &amp; remember relevant science words during activity</td> <td>I suggest what might happen in an investigation</td> </tr> <tr> <td>I describe what is happening using science (help)</td> <td>I begin to describe the cause variable in an investigation</td> </tr> <tr> <td>I add science word labels to diagrams</td> <td>I follow demo, spoken &amp; picture instructions in order</td> </tr> <tr> <td><b>Year 2</b></td> <td><b>Year 2</b></td> </tr> <tr> <td>I remember science words over a short time</td> <td>I suggest what might happen (simple prediction)</td> </tr> <tr> <td>I use science to describe &amp; recall what I have seen</td> <td>I identify the cause variable correctly</td> </tr> <tr> <td>I add science labels &amp; information (help) to diagrams</td> <td>I follow spoken &amp; written instructions in order</td> </tr> </table>	<b>Year 1</b>	<b>Year 1</b>	I use & remember relevant science words during activity	I suggest what might happen in an investigation	I describe what is happening using science (help)	I begin to describe the cause variable in an investigation	I add science word labels to diagrams	I follow demo, spoken & picture instructions in order	<b>Year 2</b>	<b>Year 2</b>	I remember science words over a short time	I suggest what might happen (simple prediction)	I use science to describe & recall what I have seen	I identify the cause variable correctly	I add science labels & information (help) to diagrams	I follow spoken & written instructions in order	Know push and pull forces in action. Forces make objects move (change). More force is needed to move on object further. More force is needed to move heavier objects.	<table border="0"> <tr> <td>Force</td> <td>softer</td> </tr> <tr> <td>push force</td> <td>heavier</td> </tr> <tr> <td>pull force</td> <td>lighter</td> </tr> <tr> <td>move</td> <td>direction</td> </tr> <tr> <td>bigger</td> <td>variable</td> </tr> <tr> <td>smaller</td> <td>cause</td> </tr> <tr> <td>more</td> <td>effect</td> </tr> <tr> <td>less</td> <td>prediction</td> </tr> <tr> <td>harder</td> <td>method</td> </tr> </table>	Force	softer	push force	heavier	pull force	lighter	move	direction	bigger	variable	smaller	cause	more	effect	less	prediction	harder	method
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<b>Key Scientist</b>	<b>Assessment of Skills</b>	<b>Assessment of Knowledge</b>																																			
<b>Isaac Newton</b> (1643-1727) English scientist that after watching an apple fall asked why it went straight down and not sideways or up. He showed that it was a force that made the apple fall and he called this force gravity in 1666.  	Explaining science Designing experiments (See SLS Assessment boards)	Forces make objects move (change). More force is needed to move on object further.																																			


Animals including humans		Term: 3	Year: 1 /2Cycle A	
<p><b>Foundations of previous learning:</b>  <b>ELGS that feed into Science:</b>                      Similarities and differences between themselves (e.g. senses) &amp; others. Extends vocabulary. Looks closely at similarities, differences, patterns and change in nature. Makes observations of animals and why things occur &amp; change (life cycles). Explores world around them, makes observations &amp; drawings. Name &amp; describe animals that live in different habitats. Observes living things throughout the year. (EYFS)</p>				
Unit Learning				
NC Objective - Coverage	Skills	Knowledge	Vocabulary	
<p>Identify and name a variety of common animals that are birds, fish, amphibians, reptiles and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets)</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p><b>Year 1</b></p> <p style="background-color: yellow; border: 1px solid black; padding: 2px;">I use &amp; remember science words during an activity</p> <p style="background-color: yellow; border: 1px solid black; padding: 2px;">I remember simple science facts within a topic</p> <p style="background-color: yellow; border: 1px solid black; padding: 2px;">I add science word labels to diagrams</p> <p><b>Year 2</b></p> <p style="background-color: yellow; border: 1px solid black; padding: 2px;">I use &amp; remember science words over time</p> <p style="background-color: yellow; border: 1px solid black; padding: 2px;">I remember a range of science facts within a topic</p> <p style="background-color: yellow; border: 1px solid black; padding: 2px;">I add science word labels &amp; information (help) to diagrams</p>	<p><b>Year 1</b></p> <p style="background-color: orange; border: 1px solid black; padding: 2px;">I sort using simple yes/no statements</p> <p style="background-color: orange; border: 1px solid black; padding: 2px;">I group by difference or similarity</p> <p><b>Year 2</b></p> <p style="background-color: orange; border: 1px solid black; padding: 2px;">I use simple spider keys with obvious differences</p> <p style="background-color: orange; border: 1px solid black; padding: 2px;">I group by difference similarity or change</p>	<p>Know types of vertebrate. Know examples of invertebrates in a habitat.                      Know examples of carnivore, herbivore and omnivore.                      Know what they mean.                      Know human body parts and our 5 senses.</p>	<p>Animal vertebrate (backbone) invertebrate (exoskeleton) fish amphibian reptile Bird mammal scales Fins gills Lung scales Fur carnivore herbivore omnivore habitat Pet head Hair Ears eyes Nose mouth</p> <p>tongue teeth Neck arm Elbow shoulder hands Fingers leg Knee ankle Feet toes Sight hearing Touch taste Feeling sort Group classify feature (criteria) spider key.</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge		
<p><b>Eugenie Clark</b> (1922-2015) Japanese-American scientist known as the 'Shark Lady' for her research on shark behaviour and marine conservation. She was the first person to 'train' sharks and developed natural shark repellents.</p> 	<p>Explaining science Classification (See SLS Assessment boards)</p>	<p>Know out five sense are sight, hearing, smell, taste and touch.                      Know that a vertebrate has a backbone and an invertebrate does not.                      Know that a carnivore eats other animals, a herbivore eats plants and an omnivore eats both.</p>		


Plants		Term: 4	Year: 1 /2 Cycle A
<p><b>Foundations of previous learning:</b>                      Begins to measure time with timers and calendars. Increasingly able to order and sequence events related to time. Looks closely at similarities, differences, patterns and change in nature. Makes observations of plants and why some things occur &amp; change. Develops understanding of growth, decay and changes over time. Explores plants in a contrasting natural environment. Observe living things throughout the year. (EYFS)</p>			
<b>Unit Learning</b>			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
<p><b>Year 1</b>                      Identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen                      Identify and describe the basic structure of a variety of common flowering plants, including roots, tem/trunk, leaves and flowers</p> <p><b>Year 2</b>                      Observe and compare how seeds and bulbs grow into mature plants                      Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p> <p><b>* To cover Y1 statements in this cycle focus on naming trees in the school grounds and observing how they change.</b>  <b>* To cover Y2 statements in this cycle pupils to grow flowers.</b></p>	<p><b>Year 1</b></p> <p>I use &amp; remember science words during an activity</p> <p>I describe what is happening using science</p> <p>I add science word labels to diagrams</p> <p><b>Year 2</b></p> <p>I use &amp; remember science words over a short time</p> <p>I use science to describe &amp; recall what I have seen</p> <p>I add science labels &amp; information (help) to diagrams</p> <p><b>Year 1</b></p> <p>I sort using simple yes/no statements</p> <p>I group by difference or similarity</p> <p><b>Year 2</b></p> <p>I use simple spider keys with obvious differences</p> <p>I group by difference similarity or change</p>	<p><b>Year 1</b>                      Know the structure of a plant.                      Know what each part does.                      Name a range of vegetable, garden and wild plants growing in a habitat.                      Name some deciduous and evergreen trees. Know their yearly life cycle.</p> <p><b>Year 2</b>                      Know and describe the stages as seeds (&amp; bulbs) grow into mature plants (<i>life cycle of a flowering plant</i>).                      Know that plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>Plant                      Leaf                      stem (trunk, branch)                      root                      flower (petals)                      bud                      fruit                      seed                      bulb                      grow                      evergreen                      deciduous                      spring                      summer                      autumn                      winter (hibernate)                      (chlorophyll – green substance in leaves that ‘makes’ food)                      Sort                      Group                      Classify                      feature (criteria)                      spider key.</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>Richard Deverell</b> (1965-) Current director of Royal Botanic Gardens at Kew. Kew Gardens in London has the world’s largest collection of plants and seeds to prevent extinctions. It carries out world-class science research and is so big it has its own police force.</p> 	<p>Explaining science                      Classification                      (See SLS Assessment boards)</p>	<p><b>Year 1</b>                      Be able to identify the roots, stem, leaf, bud and flower and know their basic functions.                      Know that plants can provide shelter, food and oxygen for animals</p> <p><b>Year 2</b>                      Know the life cycle changes as seeds grow into adult plants.                      Know that plants need water, light and warmth to grow and stay healthy.</p>	





Light		Term: 5	Year: 1 /2 Cycle A
<p><b>Foundations of previous learning:</b> Numbers from 0 to 10 (and beyond). Looks closely at similarities, differences, patterns and change in nature. Talks about why things happen and how things work. Explores the natural world around them by making observations. Explores shadows &amp; rainbows. Learns about the Earth, Sun, Moon, planets and stars. (EYFS)</p>			
Unit Learning			
*NC Objective - Coverage	Skills	Knowledge	Vocabulary
<p>Observe the apparent movement of the sun during the day</p> <p>Observe light coming from a light source. Observe light being blocked by an object to create a shadow.</p> <p>Investigate how to make a place lighter and darker.</p> <p>Know light and dark safety.</p>	<p><b>Year 1</b></p> <p>I use &amp; remember science words during an activity</p> <p>I describe what is happening using science</p> <p>I add science word labels to diagrams</p> <p><b>Year 2</b></p> <p>I use &amp; remember science words over a short time</p> <p>I use science to describe &amp; recall what I have seen</p> <p>I add science labels &amp; information (help) to diagrams</p>	<p><b>Year 1</b></p> <p>I measure numbers on a number track</p> <p>I use a simple table recording in words &amp; numbers</p> <p>I add to block charts by counting up</p> <p><b>Year 2</b></p> <p>I measure labelled standard units on a number line</p> <p>I use a simple table recording in words &amp; numbers (inc. tally)</p> <p>I use scale on a block chart (coordinate) to add correct blocks</p>	<p>To know where light comes from.</p> <p>To know how to make a dark place light.</p> <p>To find shadows.</p> <p>To know shadows are different.</p> <p>To know how to stay safe in the light and dark.</p>
			<p>Light</p> <p>Dark</p> <p>Sun</p> <p>day-length</p> <p>brightness (intensity)</p> <p>source</p> <p>eye</p> <p>material</p> <p>reflected</p> <p>reflection</p> <p>reflective</p> <p>shiny</p> <p>dull</p> <p>transparent</p> <p>opaque</p> <p>blocked</p> <p>shadow</p> <p>sun</p> <p>sky</p> <p>suncream (block)</p> <p>polaroid</p> <p>table of results</p> <p>record</p> <p>tally</p> <p>pictogram</p> <p>block-chart</p> <p>axis</p> <p>coordinate.</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>Thomas Edison</b> (1847-1931) American inventor and businessman. Invented the incandescent electric light bulb in 1878 and motion picture camera (phonograph). However, he did not invent the light bulb (Warren de la Rue, Britain 1840).</p> 	<p>Explaining Science Data, Tables and Graphs. (See SLS assessment board)</p>	<p>Know that the sun, a bulb and a torch are light sources.</p> <p>Know that the light from a light source can be brighter or dimmer.</p> <p>Know that opaque objects block light and so form a shadow behind them.</p>	


Seasonal changes		Term: Across the year	Year: 1/2 Cycle A
<b>Foundations of previous learning:</b> Numbers from 0 to 10 (and beyond). Begins to measure time with timers and calendars. Increasingly able to order and sequence events related to time. Know about similarities, differences & in relation to places and living things. Talks about why things happen and how things work. Makes observations & drawings. Talks about seasons & states of matter. Plays & explores outside in all seasons and in different weather. (EYFS)			
Unit Learning			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
Observe the apparent movement of the sun during the day  Observe changes across the four seasons  Observe and describe weather associated with the seasons and how day length varies	<p><b>Year 1</b></p> <p>I use &amp; remember science words during an activity</p> <p>I remember simple science facts within a topic</p> <p>I describe what is happening using science</p> <p><b>Year 2</b></p> <p>I use &amp; remember science words over a short time</p> <p>I remember a range of science facts within a topic</p> <p>I use science to describe &amp; recall what I have seen</p>	<p><b>Year 1</b></p> <p>I use a simple table recording in words &amp; numbers</p> <p>I use a frame to add to pictograms &amp; block charts</p> <p>I add to block charts by counting up</p> <p><b>Year 2</b></p> <p>I use a simple table recording in words &amp; numbers (inc. tally)</p> <p>I construct simple pictograms &amp; block charts</p> <p>I use scale on a block chart (coordinate) to add correct blocks</p>	Describe the weather Know how weather can be measured. To know there are four seasons. To know the names of the seasons.
			Season Sun sky autumn winter spring summer day week month year weather hot warm cool cold sunny cloudy  snowy rainy dry windy still light dark senses temperature day-length table of results record tally pictogram block-chart axis coordinate.
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>John Dalton</b> (1766-1844) English scientist and early weather pioneer. He used home-made instruments to gather data on weather over time and turned weather forecasting into a science. We still use data he gathered to this day.</p> 	Explaining science Data, tables and graphs (See SLS Assessment boards)	Know we have four seasons which are Spring, Summer, Autumn and Winter. Know that in summer it is generally sunny and hot and in winter it may hail and snow.	

Living things and their habitats (2)		Term: 1	Year: 1/2 Cycle B
<p><b>Foundations of previous learning:</b>                      Identify local plants &amp; animals by sight (Plants; Animals Yr1)                      Define/identify carnivore, herbivore &amp; omnivore (Animals Yr1)                      Identify natural &amp; man-made materials (Materials Yr1 &amp; Yr2)                      Identify sun as natural source of light (energy) (Light Yr1)                      Identify seasonal changes for abiotic factors (seasons Yr1)</p>			
Unit Learning			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
<p>Explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>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</p> <p>Identify and name a variety of plants and animals in their habitats, including microhabitats</p> <p>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.</p>	<p><b>Year 1</b></p> <p>I use &amp; remember science words during an activity</p> <p>I describe what is happening using science</p> <p>I add science word labels to diagrams</p> <p><b>Year 2</b></p> <p>I use &amp; remember science words over a short time</p> <p>I use science to describe what I have seen</p> <p>I add science labels &amp; information (help) to diagrams</p>	<p><b>Year 1</b></p> <p>I sort using simple yes/no statements</p> <p>I group by difference or similarity</p> <p><b>Year 2</b></p> <p>I use spider keys with obvious differences</p> <p>I group by difference similarity or change</p>	<p>Know the differences between things that are living, dead and those that have never been alive.                      Describe how habitats give a place for animals and plants to live, grow and feed. Show how living things are suited to their habitat (microhabitat).                      Identify and name plants and animals in their habitats.                      Describe food chains. Identify and name sources of food.</p> <p>Living                      Dead                      non-living                      movement                      respiration                      breathing                      energy                      sensitivity                      sight                      touch                      hearing                      smell                      taste                      growth                      reproduction                      offspring                      excretion</p> <p>waste                      nutrition                      habitat                      microhabitat                      conditions                      adapted                      adaptation                      light                      temperature                      water                      humidity                      food chain                      feeding                      sort                      group                      classify                      criteria                      spider key.</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>David Attenborough</b> (1926-) British scientist and broadcaster made ground-breaking programmes about wildlife and conservation since the 1960s. He has had a huge influence on engaging and bringing wildlife decline into common understanding.</p> 	<p>Explaining science                      Classification                      (See SLS Assessment boards)</p>	<p>Know when living things are living, dead and have never been alive.                      Know habitats and micro-habitats help living things to live and feed.                      Know that living things are connected through food chains.</p>	


Everyday Materials (1 and 2)		Term: 2	Year: 1/2 Cycle B
<p><b>Foundations of previous learning:</b>                      Can link object to its material (Materials Yr1)                      Can link materials to their properties (Materials Yr1; Light Yr1)                      Can classify materials based upon properties (Materials Yr1)                      Materials can have multiple properties (Materials Yr1)                      Can begin to test materials for a property (materials Yr1)                      Can begin to choose materials for a task based upon properties. Can give reasons for their choices (materials Yr1)</p>			
Unit Learning			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
<p><b>Year 1</b>                      Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock</p> <p>Describe simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties</p> <p><b>Year 2</b>                      Identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard.</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><b>Year 1</b></p> <p>I group by difference or similarity</p> <p>I link properties of materials to an application (help)</p> <p><b>Year 2</b></p> <p>I group by difference similarity or change</p> <p>I link properties of materials to an application</p> <p><b>Year 1</b></p> <p>I use some equipment correctly</p> <p>I begin to identify the cause variable in an investigation</p> <p>I follow short demo, spoken &amp; picture instructions</p> <p><b>Year 2</b></p> <p>I use a range of equipment correctly</p> <p>I identify the cause variable correctly</p> <p>I follow short spoken &amp; written instructions in order</p>	<p><b>Year 1</b>                      Know the materials which objects are made from.                      Know and describe the properties of a range of materials.                      Can compare and sort a range of materials by their properties.</p> <p><b>Year 2</b>                      To know what things are made from.                      To know the properties of different materials                      To be able to change the shape of materials                      To know what a solid, liquid and gas are.</p> <p><b>* In cycle B focus on exploring materials outdoors.</b></p>	<p>Object Material Wood Metal Plastic Wool Cotton Paper Cork Rock Glass Fabric Ceramic Rope Concrete Brick Rubber Sponge Elastic Foil Ice Water water vapour property rigid bendy (flexible) hard soft waterproof absorbent</p> <p>warm cold rough smooth dull shiny opaque transparent application solid liquid gas squash bend twist stretch force sort group classify criteria equipment variable variable label cause effect investigation range method</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>John Dunlop</b> (1840-1921) Scottish inventor and vet. Developed the first rubber inflatable tyres for use on bicycles in 1890 which revolutionised comfort and speed. He founded Dunlop Tyres Co that allowed cars and motorbikes to later develop.</p> 	<p>Classification                      Designing experiments                      (See SLS Assessment boards)</p>	<p><b>Year 1</b>                      Know the materials which objects are made from.                      Know and be able to use properties rigid, flexible, hard, soft and waterproof.</p> <p><b>Year 2</b>                      Know that you can change the shape of an object by squashing, bending, twisting and stretching                      Know materials can make different objects (e.g. metal – coins, cars, cans); the same object can be made from different materials (e.g. spoon – plastic, metal, wood).</p>	

Animals including humans (2)		Term: 3	Year: 1/2 Cycle B	
<p><b>Foundations of previous learning:</b>                      Can classify into vertebrate (groups) &amp; invertebrates. Can classify into carnivores, herbivore &amp; omnivores (Animals Yr1)                      Can link 5 senses to sense organs (Animals Yr1)                      Knows 7 processes of life – growth, nutrition (Living things Yr2)                      Habitat provides basic needs –, water, heat, food (Living Yr2)                      Matter exists as solids, liquids &amp; gases (Materials Yr2)</p>				
Unit Learning				
NC Objective - Coverage	Skills	Knowledge	Vocabulary	
<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><b>Year 1</b></p> <p>I use &amp; remember science words during an activity</p> <p>I use science to describe what is happening</p> <p>I add science word labels to diagrams</p> <p><b>Year 2</b></p> <p>I use &amp; remember science words over a short time</p> <p>I use science to describe &amp; recall what I have seen</p> <p>I add science labels &amp; information (help) to diagrams</p>	<p><b>Year 1</b></p> <p>I measure numbers with a number track</p> <p>I use a simple table recording in words &amp; numbers</p> <p>I use a frame to add to pictograms &amp; block charts</p> <p><b>Year 2</b></p> <p>I measure labelled divisions on a number line</p> <p>I use a simple table recording in words &amp; numbers (inc. tally)</p> <p>I construct pictograms &amp; block charts</p>	<p>To know what happens to our bodies as they grow.                      To know how other animals grow and how they differ to us.                      To know what we need to live and be healthy.                      To know why exercise is important.                      To know why it is important to keep clean.</p>	<p>Baby                      Offspring                      Toddler                      Child                      Adolescent                      Teenager                      Adult                      Reproduction                      Growth                      Water                      Hydrated                      Food                      Nutrition                      Diet                      Balanced                      Air                      Oxygen                      Breathing                      Respiration</p> <p>Exercise                      Fitness                      heart rate                      pulse                      hygiene                      microbes (bacteria, viruses, fungi)                      number track                      number line                      division                      table of results                      cause                      effect                      pictogram                      block                      block chart                      bar                      bar chart                      axes                      coordinate.</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge		
<p><b>Dr Kelly Blacklock</b> graduated from the University of Edinburgh and completed a rotating internship at the Royal Veterinary College and a three-year ECVS approved residency programme in the Small Animal Surgery at the University of Bristol. Kelly joined the Animal Health Trust in 2011 and was awarded a PhD from the University of Liverpool for studies into the genetics of metastasis in canine cancer.</p> 	<p>Explaining science                      Data, tables and graphs                      (See SLS Assessment boards)</p>	<p>Know animals have offspring which grow into adults.                      Know animals need water, food and air to survive.                      We need to exercise, eat the right amounts food and keep ourselves clean.</p>		


Plants (1 and 2)		Term: 4	Year: 1/2 Cycle B
<p><b>Foundations of previous learning:</b>            Know basic structure of a flowering plant (Plants Yr1)            Can identify garden, wild plants &amp; trees (Plants Yr1)            Can identify plants in local habitats by sight (Plants Yr1)            Knows seasonal life cycle of deciduous trees (Plants Yr1)            Observed changes to plants across the seasons (Seasons Yr1)            Knows 7 processes of life – growth, nutrition (Living things Yr2)            Habitat provides basic needs – light, water, warmth (Living Yr2)</p>			
<b>Unit Learning</b>			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
<p><b>Year 1</b>            Identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen            Identify and describe the basic structure of a variety of common flowering plants, including roots, tem/trunk, leaves and flowers</p> <p><b>Year 2</b>            Observe and compare how seeds and bulbs grow into mature plants            Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p> <p><b>* To cover Y1 statements in this cycle focus on plants in an ornamental bed</b>  <b>* To cover Y2 statements in this cycle pupils to grow vegetables.</b></p>	<p><b>Year 1</b></p> <p>I suggest what might happen in an investigation</p> <p>I begin to identify the cause variable in an investigation</p> <p>I follow demo, spoken &amp; picture instructions</p> <p><b>Year 2</b></p> <p>I suggest what might happen (simple prediction)</p> <p>I identify the cause variable correctly in an investigation</p> <p>I follow short spoken and written instructions in order</p> <p><b>Year 1</b></p> <p>I recognise, create &amp; describe number patterns</p> <p>I describe the changes that are happening</p> <p>I explore different ways to do things through play</p> <p><b>Year 2</b></p> <p>I describe features and patterns in data and charts</p> <p>I describe the changes that have happened</p> <p>I suggest a different way to do things with help</p>	<p><b>Year 1</b>            Know the structure of a plant.            Know what each part does.            Name a range of vegetable, garden and wild plants growing in a habitat.            Name some deciduous and evergreen trees. Know their yearly life cycle.</p> <p><b>Year 2</b>            Know and describe the stages as seeds (&amp; bulbs) grow into mature plants (<i>life cycle of a flowering plant</i>).            Know that plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>Leaf            leaf vein            mid-rib            stem            root            flower            bud            shoot            tap root            side root            seed            bulb            germinate            grow            cotyledon            seedling            adult</p> <p>water            light            temperature            survive            reproduction            experiment            variable            observe            measure            cause            effect            comparative test            fair test            method            data range            predict            pattern</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>George Washington Carver</b> (1864-1943) An American ex-slave that became a professor of agriculture at Tuskegee Institute. He developed techniques to improve soil for growing cotton and encouraged poor farmers to grow other crops for better nutrition.</p> 	<p>Designing experiments            Making conclusions            (See SLS Assessment boards)</p>	<p><b>Year 1</b>            Be able to identify the roots, stem, leaf, bud and flower and know their basic functions.            Know that plants can provide shelter, food and oxygen for animals</p> <p><b>Year 2</b>            Know the life cycle changes as seeds grow into adult plants.            Know that plants need water, light and warmth to grow and stay healthy.</p>	


Electricity (2)		Term: 5	Year: 1/2 Cycle B
<p><b>Foundations of previous learning:</b>                      Can identify materials such as metal / plastic (Materials Yr1)                      Know these materials have properties (Materials Yr1)                      Can sort materials by these properties (Materials Yr1/2)                      May know metals conduct electricity – use (Materials Yr2)                      Know bulbs need electricity to work – torch (Light Yr1)</p>			
<b>Unit Learning</b>			
*NC Objective - Coverage	Skills	Knowledge	Vocabulary
Identify appliances that run on electricity  Recognise the need for a power source (mains, battery, rechargeable, renewable, etc) and a circuit to make an appliance work.  Identify both the component and its symbol in a simple circuit.  Build simple closed series circuits  Know electrical safety	<p><b>Year 1</b></p> <p>I use &amp; remember science words during an activity</p> <p>I use science to describe what is happening</p> <p>I add science word labels to diagrams</p> <p><b>Year 2</b></p> <p>I use &amp; remember science words over a short time</p> <p>I use science to describe &amp; recall what I have seen</p> <p>I add science labels &amp; information (help) to diagrams</p>	<p><b>Year 1</b></p> <p>I use some science equipment correctly</p> <p>I notice risk with help &amp; can list some common dangers</p> <p>I follow short demo, spoken &amp; picture instructions</p> <p><b>Year 2</b></p> <p>I use a range of science equipment correctly</p> <p>I notice risk in my investigation &amp; know common dangers</p> <p>I follow short spoken &amp; written instructions in order</p>	<ul style="list-style-type: none"> <li>Know appliances that need electricity (power/energy source) to work (mains, battery, rechargeable, etc).</li> <li>Can name (with their symbol) and use components correctly and safely in a simple circuit.</li> <li>Can build simple closed series circuits from instructions.</li> <li>Can identify dangers and know how to use electricity safely in the home and classroom.</li> </ul> <p><i>(Care with term 'power' to describe electricity at this early stage in learning. It is not wrong but does not build understanding (Energy Transfer Model) for later work in KS2).</i></p>
<b>Key Scientist</b>	<b>Assessment of Skills</b>	<b>Assessment of Knowledge</b>	Electricity source, flow / transfer circuit closed / open series mains supply battery appliance rechargeable plug socket wire bulb buzzer motor conductive non-conductive component switch clips symbol risk method predict (prediction)
<p><b>Stanley Whittingham</b> (1941-) British-American scientist who invented the rechargeable Lithium-ion battery in 1977 that we currently use today in mobile phones, laptops and cars. Lithium batteries can hold much more energy than old lead-acid batteries.</p> 	Explaining science Designing experiments (See SLS Assessment boards)	Know a range of appliances that need electricity to work. Be able to name a bulb, battery, buzzer and wire. Know that electricity can be dangerous.	


Science Curriculum


Animals including humans		Term: 1	Year: 3
<b>Foundations of previous learning:</b> Can label human body parts / compare (Animals Yr1) Knows & identifies a push & pull force (Forces Yr1) Vertebrates have a backbone & skeleton (Animals Yr1)		Know 7 processes of life – movement, nutrition (Living Yr2) Animals need food to grow and repair our body (Animals Yr2) Need 5 food types in right amounts for health Animals Yr2) Food provides energy. Some more than others (Animals Yr2)	
Unit Learning			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat  Identify that humans and some animals have skeletons and muscles for support, protection and movement	<div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="border: 2px solid blue; padding: 5px; background-color: yellow; margin: 5px;">I remember science words I have used before</div> <div style="border: 2px solid blue; padding: 5px; background-color: lightgreen; margin: 5px;">I measure unlabelled divisions on a number line</div> <div style="border: 2px solid blue; padding: 5px; background-color: yellow; margin: 5px;">I begin to use science models to describe</div> <div style="border: 2px solid blue; padding: 5px; background-color: lightgreen; margin: 5px;">I use a frame to construct a simple table of results</div> <div style="border: 2px solid blue; padding: 5px; background-color: yellow; margin: 5px;">I add science labels &amp; information to diagrams</div> <div style="border: 2px solid blue; padding: 5px; background-color: lightgreen; margin: 5px;">I use a frame to construct a bar chart</div> </div>	Animals (including humans) need the right types and amounts of food (nutrition). <i>Unlike plants, animals can't make their own food – they need to transfer energy in through food.</i> Humans (and some other animals) have skeletons and muscles for support, protection and movement	<div style="display: flex; justify-content: space-between;"> <div>             Nutrition              photosynthesis              energy              transfer              diet              carbohydrate (sugar)              protein              fat              vitamins              minerals              fibre              balanced              unbalanced              obesity              starvation              skeleton              bones (various, humerus, ulna, radius)              joint (hinge)              vertebrate           </div> <div>             invertebrate              muscles (triceps, biceps)              tendon              antagonistic              pull force              push force              number line              division              table of results              cause              effect              pictogram              block              block chart              bar              bar chart              axes              coordinate           </div> </div>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<b>Doris Howes</b> Calloway (1923-2001) American scientist whose research set the Recommended Daily Amounts (RDAs) for foods that reduced malnutrition especially in pregnant women and minority groups.  	Explaining science. Data, tables and graphs. (See SLS Assessment boards)	Know that animals (humans) need the right amounts of food (balanced diet). Know that, unlike plants, animals can't make their own food. Know animals (humans) have a skeleton and muscles for support, protection and movement. Bones are moved by muscle pairs working together. Vertebrates have an endoskeleton; other animals have an exoskeleton (e.g. insect) or a hydro-skeleton (e.g. worm) made of water.	





Rocks		Term: 2	Year: 3	
<p><b>Foundations of previous learning:</b>                      Can identify types of rock as materials (Materials Yr1)                      Can describe uses of rock as a material (Materials Yr2)                      Forces change materials shape (Forces Yr1/3; Materials Yr2)                      Can identify a range of animals/plants (Plants Yr1; Animals Yr1)                      Habitats contain soil (Living things Yr2)</p>				
<b>Unit Learning</b>				
NC Objective - Coverage	Skills		Knowledge	Vocabulary
<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p>	<div style="border: 2px solid #0056b3; background-color: yellow; padding: 5px; margin-bottom: 10px;">I remember science words I have used before</div> <div style="border: 2px solid #0056b3; background-color: yellow; padding: 5px; margin-bottom: 10px;">I begin to use science models to describe</div> <div style="border: 2px solid #0056b3; background-color: yellow; padding: 5px;">I add science labels &amp; information to diagrams</div>	<div style="border: 2px solid #0056b3; background-color: orange; padding: 5px; margin-bottom: 10px;">I use a large spider key with obvious differences</div> <div style="border: 2px solid #0056b3; background-color: orange; padding: 5px; margin-bottom: 10px;">I create groups for sorting (create criteria)</div> <div style="border: 2px solid #0056b3; background-color: orange; padding: 5px;">I combine properties required for an application</div>	<p>Identify &amp; describe different kinds of rocks using appearance and physical properties.  <i>Sedimentary rock is laid down in layers in lakes, seas and deserts. Metamorphic rock is formed deep within the earth. Igneous rock is formed when volcanoes erupt.</i>  <i>Rocks have lots of uses in our everyday lives.</i>                      Fossils are formed when things that have lived are trapped within rock over millions of years.                      Soils are made from rocks and organic matter.</p>	<p>Rocks (e.g. sandstone, limestone, chalk, shale, coal, conglomerate, granite, slate, marble, basalt, obsidian, pumice, etc)                      texture                      crystals                      minerals                      sedimentary                      layers / bands                      metamorphic                      heat                      pressure                      igneous                      magma                      larva                      fossil (body, trace, cast, mould)                      petrification                      soil                      clay                      silt                      sand                      organic matter                      key                      spider key                      criteria                      classify (classification)                      sort                      group                      material                      property                      application</p>
Key Scientist	Assessment of Skills		Assessment of Knowledge	
<p><b>Barnum Brown</b> (1873-1963) American fossil hunter known as ‘Mr Bones’. He discovered the first <i>Tyrannosaurus rex</i> in Montana in 1902. He became famous and started a craze for fossil hunting.</p> 	<p>Explaining science                      Classification                      (See SLS Assessment boards)</p>		<p>Know and identify types of rock using their appearance and properties.                      Know that sedimentary rock is laid down in layers in lakes, seas and deserts.                      Know that rocks have lots of uses in our everyday lives.                      Fossils form when living things die and become trapped within rock over millions of years. Fossils tell us how living things have changed over time.                      Soils are made from eroded rock and organic matter.</p>	


Forces and magnets		Term: 3	Year: 3
<p><b>Foundations of previous learning:</b>                      Recognise &amp; name push &amp; pull forces (Forces Yr1)                      Force needed to move an object; force changes the direction &amp; speed of a moving object; more force more change (ForcesYr1)                      Bigger force needed to move a heavier object (Forces Yr1)                      Begins to use Force Arrow Model to describe force (ForcesYr1)                      Knows a range of materials, including metals (Materials Yr1/2)                      Links materials to property (Materials Yr1/2)</p>			
Unit Learning			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
<p>Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between two objects and some forces act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing</p>	<p>I remember science words I have used before</p> <p>I predict cause &amp; effect (science prediction)</p> <p>I begin to use science models to describe</p> <p>I identify cause &amp; effect in an investigation</p> <p>I add science labels &amp; information to diagrams</p> <p>I suggest a suitable data range for the cause variable</p>	<p>Be able to describe a force using a <i>Force Arrow Model</i>.</p> <p>Some forces need contact (contact forces) between two objects and some forces act at a distance (non-contact forces).</p> <p>Magnets attract or repel each other. Magnets have two poles.</p> <p>Materials can be grouped together based upon whether they are attracted to a magnet (magnetic) or not.</p>	<p>Force</p> <p>force arrow</p> <p>contact force</p> <p>push force</p> <p>pull force</p> <p>twist force</p> <p>friction force</p> <p>non-contact force</p> <p>gravity force</p> <p>movement</p> <p>magnet (types)</p> <p>attract</p> <p>repel</p> <p>poles (north and south)</p> <p>magnetic</p> <p>non-magnetic</p> <p>magnetism</p> <p>variable</p> <p>cause</p> <p>effect</p> <p>prediction</p> <p>comparative test</p> <p>fair test</p> <p>pattern</p> <p>method</p> <p>relationship</p> <p>trend</p> <p>data range</p> <p>data interval</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>William Gilbert</b> (1544-1603) English scientist who was the first to study magnets using the scientific method. He also discovered that the Earth is a weak magnet.</p> 	<p>Explaining science</p> <p>Designing experiments</p> <p>(See SLS Assessment boards)</p>	<p>Know forces change the speed, direction and shape of an object.</p> <p>Know pushes, pulls and friction force are examples of contact forces.</p> <p>Know gravity and magnetism are examples of non-contact forces.</p> <p>Magnets attract or repel each other. Magnets have two poles.</p> <p>Know that materials can be either magnetic or non-magnetic.</p>	


Light		Term: 4	Year: 3	
<p><b>Foundations of previous learning:</b>                      Identify a range of light sources (natural &amp; man-made). Identify the sun as a light source. Light/sun safety (Light Yr1)                      Light is brighter closer to a light source. Reflective materials (shiny/dull). Light passes through transparent. Opaque blocks light; forms shadow (Materials Yr1/2, Light Yr1)                      Sun moves across the sky. Day-length (Seasons, Light Yr1)                      Plants need light to survive &amp; make food (Plants Yr2)</p>				
<b>Unit Learning</b>				
NC Objective - Coverage	Skills		Knowledge	Vocabulary
<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.</p> <p>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 a solid object.</p> <p>Find patterns in the way that the size of shadows change.</p>	<p>I remember science words I have used before</p> <p>I begin to use science models to describe</p> <p>I add science labels &amp; information to diagrams</p>	<p>I predict cause &amp; effect (science prediction)</p> <p>I identify cause &amp; effect in an investigation</p> <p>I suggest a suitable data range for the cause variable</p>	<p>We need light to see things. Dark is the absence of light.  <i>There are natural and artificial sources of light energy</i>                      Light from the sun can be dangerous. We protect our eyes                      Light can be reflected from surfaces (<i>reflected light energy</i>)                      Shadows are formed when light is blocked by an opaque object (<i>shadow = absence of transmitted light energy</i>)                      Know how to change the size of a shadow.</p>	<p>Light                      dark                      energy                      quantity                      transfer                      source                      eye                      reflected                      reflection                      reflective                      shiny                      dull                      transmitted                      transparent                      translucent                      opaque                      blocked                      shadow                      absorbed                      variable                      cause                      effect                      prediction                      fair test                      method                      relationship                      trend                      data range                      data interval</p>
Key Scientist	Assessment of Skills		Assessment of Knowledge	
<p><b>Ibn al-Haytham</b> (965-1040) Iraqi is described as the first true scientist. Used maths to describe vision due to light reflecting off an object into your eye. Vision then occurs in your brain.</p> 	<p>Explaining science                      Designing experiments                      (See SLS Assessment boards)</p>		<p>Know that we need light to see things. Dark is when there is no light.                      Know examples of natural and man-made sources of light (energy).                      Know that the sun's light energy is very high. It can damage our eyes.                      Know that light can be reflected off a surface (reflected light energy).                      Know that a shadow forms when the transfer of light energy is blocked by an object. Know how to change the size of a shadow.</p>	

Plants		Term: 5	Year: 3
<p><b>Foundations of previous learning:</b>                      Know structure/function of a flowering plant (Plants Yr1/2)                      Can identify garden, wild plants &amp; trees (Plants Yr1)                      Knows seasonal life cycle of deciduous trees (Plants Yr1)                      Knows 7 processes of life – growth, nutrition (Living things Yr2)                      Habitat provides basic needs – light, water, warmth (Living Yr2)                      Can investigate need for light, water and warmth (Plants Yr2)                      Knows soil is a source of water &amp; nutrients (Rocks Yr3)</p>			
Unit Learning			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
<p>Identify &amp; describe the functions of different parts of flowering plants: roots, stem, leaves and flowers</p> <p>Explore the requirements for plant life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>	<p>I remember science words I have used before</p> <p>I predict cause &amp; effect (science prediction)</p> <p>I begin to use science models to describe</p> <p>I identify cause &amp; effect in an investigation</p> <p>I add science labels &amp; information to diagrams</p> <p>I suggest a suitable data range for the cause variable</p>	<p>Identify &amp; describe the functions of parts of flowering plants (roots, stem, leaves, etc) and the flower in detail. (<i>Introduce conceptual link between structure &amp; function</i>).</p> <p>Plants need air, light, water, nutrients from soil, and room to grow to survive and grow well.</p> <p>Water is moved within plants from the roots to the leaves through tubes called xylem vessels.</p> <p>Flowers support reproduction through pollination, seed formation and seed dispersal (link to the life cycle).</p>	<p>Life cycle</p> <p>leaf</p> <p>photosynthesis</p> <p>mid-rib</p> <p>leaf-veins</p> <p>petiole</p> <p>stem</p> <p>xylem vessels</p> <p>flower</p> <p>bud</p> <p>petal</p> <p>sepal</p> <p>anther</p> <p>filament</p> <p>stigma</p> <p>pollen</p> <p>style</p> <p>ovary</p> <p>ovule</p> <p>shoot</p> <p>root</p> <p>tap root</p> <p>lateral root</p> <p>root hairs</p> <p>seed</p> <p>seed coat (testa)</p> <p>bulb</p> <p>grow</p> <p>radicle</p> <p>plumule</p> <p>cotyledon</p> <p>seedling</p> <p>adult</p> <p>water</p> <p>light</p> <p>temperature</p> <p>survive</p> <p>reproduction</p> <p>absorb (absorbed)</p> <p>transported</p> <p>healthy</p> <p>nutrients</p> <p>carbon dioxide</p> <p>oxygen</p> <p>germinate (germination)</p> <p>pollination</p> <p>fertilize (fertilization)</p> <p>dispersal</p> <p>variable</p> <p>cause</p> <p>effect</p> <p>prediction</p> <p>pattern</p> <p>comparative test</p> <p>fair test</p> <p>method</p> <p>relationship</p> <p>trend</p> <p>data range</p> <p>data interval</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>Janaki Ammal</b> (1897-1984) Indian scientist that bred the sweetest sugar cane in the world and meant India could stop importing sugar. She was also a strong environmental activist.</p> 	<p>Explaining science</p> <p>Making conclusions</p> <p>(See SLS Assessment boards)</p>	<p>Describe reproduction through pollination, seed formation and dispersal.</p> <p>Know that plants need air, light, water, nutrients and enough room to grow.</p> <p>Water is moved from roots to leaves through xylem vessels.</p>	

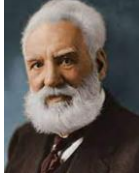
Living things and their habitats		Term: 1	Year: 4
<p><b>Foundations of previous learning:</b>                      Identify local plants &amp; animals by sight (Plants; Animals Yr1)                      Define/identify carnivore, herbivore &amp; omnivore (Animals Yr1)                      Requirements for plant/animal growth (Plants; Animals Yr2/3)                      Life cycle of plant (flowering) &amp; animal (Plants; Animals Yr2/3)                      Skeleton (&amp; exoskeleton) (Animals Yr3)                      Describe habitats &amp; micro-habitats (Living things Yr2)                      Construct food chains (transfer food/energy) (Living things Yr2)</p>			
Unit Learning			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
<p>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>	<p>I use a spider key with fine differences</p> <p>I create appropriate groups for sorting (create criteria)</p> <p>I construct a simple table to compare cause &amp; effect</p> <p>I construct a bar chart correctly</p> <p>I plot coordinates (data points) on a graph</p>	<p>Living things can be grouped in a variety of ways. Use classification keys to group, identify and name living things in local habitats.</p> <p>Know how to randomly sample a habitat for species diversity (biodiversity). Measure species richness &amp; abundance</p> <p>Environments can change and this can pose dangers to living things. Conservation acts to save species and restore habitats.</p> <p>Learn how to change a habitat to encourage biodiversity.</p>	<p>Habitat environment micro-habitat abiotic plants (habitat specific examples) animals (habitat specific examples) vertebrates invertebrates predator prey adapted (adaptation) competition pollution toxic conservation species diversity richness abundance</p> <p>biodiversity sample (sampling) pit-fall trap sweep net pooter key spider key number key classify (classification) feature table of results cause effect repeats (repetition) bar chart bar graph axes data point coordinate</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>Thomas Lovejoy</b> (1941-2021) American scientist described as the 'Godfather of biodiversity'. Conservationist and policy advisor at a global level. First to describe the effect of tropical deforestation.</p> 	<p>Classification Data, tables and graphs (See SLS Assessment boards)</p>	<p>Know living things can be grouped in different ways. Use Keys to name.</p> <p>Know how to sample a habitat to measure biodiversity.</p> <p>Know that environments can change and this can affect living things.</p>	


Animals including humans		Term: 2	Year: 4
<p><b>Foundations of previous learning:</b>                      Identify carnivores, herbivores &amp; omnivores (Animals; year1)                      Know the 7 processes of life – nutrition (Living Things; year2)                      Plants need light to grow (Plants; year 2)                      Describe simple food chains (Living Things; year 2)                      Identify &amp; name different sources of food (Living Things; year2)                      Importance of right types of food &amp; energy (Animals; year2/3)                      Light/food is energy that can be transferred (Light; year3)</p>			
Unit Learning			
NC Objective - Coverage	Skills		Knowledge
<p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p>	<p>I remember &amp; use science words correctly</p> <p>I use science models to describe</p> <p>I annotate diagrams to help describe &amp; explain</p>	<p>I describe simple patterns, trends &amp; relationships</p> <p>I describe trends &amp; use science models to explain</p> <p>I suggest sensible improvements to a method</p>	<p>Know the basic functions of parts of the digestive system in humans. Digestion breaks down food into smaller and smaller bits to eventually get through the gut into the blood.                      Identify different types of teeth and describe their functions.                      Construct and interpret food chains. Identify producers (of energy), consumers (of energy), predators &amp; prey.</p>
			<p>Nutrition                      nutrients                      digestion (physical / chemical)                      enzymes                      acid                      mouth                      teeth                      incisor                      canine                      pre-molar                      molar                      enamel                      bacteria                      plaque                      decay                      hygiene                      gullet (oesophagus)                      stomach                      small intestine                      large intestine                      anus                      liver                      gall bladder</p> <p>pancreas                      absorb (absorption)                      faeces                      diet                      carbohydrate                      protein                      fat                      energy                      calories                      food chain                      producer                      consumer                      predator                      prey                      transfer                      carnivore                      herbivore                      omnivore                      pattern                      trend                      relationship                      conclusion                      valid (validity)</p>
Key Scientist	Assessment of Skills		Assessment of Knowledge
<p><b>Marie Maynard Daly (1921-2003)</b> Discovered a number of digestive enzymes (e.g. amylase in the mouth) and also worked on DNA. First black female to get a PhD in America.</p> 	<p>Explaining science                      Making conclusions                      (See SLS Assessment boards)</p>		<p>Know we have incisors, canines, molars and pre-molars.                      Know that a food chain shows how food energy is passed along through different creatures by feeding.                      Know that digestion is the process of breaking food down into tiny pieces.</p>


Electricity		Term: 3	Year: 4	
<p><b>Foundations of previous learning:</b>                      Group objects according to their material (Materials; yr1)                      Some materials are conductors &amp; insulators (Materials; yr2)                      Appliances need electricity (source) to work (Circuits; yr2)                      Artificial light sources need energy from battery (light; yrs 1/3)                      Can name components with symbols in a circuit (Circuits; yr2)                      Can build simple series circuits from instructions (Circuits; yr2)                      Can identify electric dangers &amp; keep safe (Circuits; yr2)</p>				
Unit Learning				
NC Objective - Coverage	Skills	Knowledge	Vocabulary	
<p>Identify common appliances that run on electricity</p> <p>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>I remember &amp; use science words correctly</p> <p>I use science models to describe</p> <p>I annotate diagrams to help describe &amp; explain</p>	<p>I describe simple patterns, trends &amp; relationships</p> <p>I describe trends &amp; use science models to explain</p>	<p>Recognise common appliances that run on electricity.                      Construct a range of simple closed series circuits. Draw these circuits with correct component symbols (named).                      Recognise and solve 'errors' in circuits to make them work.                      A switch opens and closes a circuit.                      Conductors allow electrical (energy) to pass through them. Insulators do not allow electrical (energy) to pass through.</p>	<p>Electric (electricity)                      source                      energy                      transfer                      flow                      closed / open circuits                      series                      cell                      battery                      positive                      negative                      wire                      bulb                      buzzer                      motor                      switch                      clip                      light                      sound                      conductor                      insulator                      metal                      copper                      iron                      steel                      non-metals                      plastic                      wood                      glass                      rubber                      pattern                      trend                      relationship                      conclusion                      valid (validity)</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge		
<p><b>James Clerk Maxwell</b> (1831-1879) Scottish scientist who worked on wide-ranging developments in electricity &amp; electronics, including radio, television and radar. He is one of our greatest ever scientists.</p> 	<p>Explaining science                      Making conclusions                      (See SLS Assessment boards)</p>	<p>Know that a switch opens (disconnects) and closes (connects) a circuit.                      Know that a conductor allows the energy to pass through.                      Know that an insulator does not allow the energy to pass through.                      Can name a range of appliances that use electrical energy. Identifies source (mains, battery, etc)</p>		

States of matter		Term: 4	Year: 4
<p><b>Foundations of previous learning:</b>                      Simple properties of solid, liquid &amp; gas (Materials Yr1 &amp; 2)                      Clouds form rain which falls as water (Seasons Yr1)                      Warm air evaporates water; cold air freezes water (Seasons Yr1)                      Materials can be squashed (Materials Yr2)                      Rocks can be broken down (into particles) (Rocks Yr3)</p>			
Unit Learning			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
<p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<p>I remember &amp; use science words correctly</p> <p>I predict a trend (relationship prediction)</p> <p>I use science models to describe</p> <p>I plan investigations by selecting variables to change</p> <p>I annotate diagrams to help describe &amp; explain</p> <p>I suggest a data range &amp; interval for the cause variable</p>	<p>To know what a solid, liquid and a gas are.                      To know what solids, liquids and gases are made of.                      To know what happens when substances change state.                      To understand evaporation and condensation.                      To understand the water cycle.</p>	<p>Material substance                      solid                      liquid                      gas                      flow                      compressed                      volume                      density                      state                      particle                      energy                      movement                      collision                      attraction                      heat                      temperature (oCelsius)                      ice                      water                      water vapor                      melting</p> <p>boiling                      freezing                      condensation                      evaporation                      speed (rate)                      melting point                      boiling point                      water cycle                      run-off                      rainfall (precipitation)                      variable                      cause                      effect                      prediction                      comparative test                      fair test                      pattern                      method                      relationship                      trend                      data range                      data interval</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>Democritus</b> (460-370 BC) Ancient Greek scientist who taught that matter can be cut into smaller units. The smallest units he called atoms ('atomos' meaning uncuttable).</p> 	<p>Explaining science                      Designing experiments                      (See SLS Assessment boards)</p>	<p>Know that the particles in a gas have lots of energy and move around quickly, the particles in a liquid have less energy and therefore move around less quickly and the particles in a solid have even less energy and are held together strongly and can't move around.                      Know that a Solid – rigid (holds shape/volume), not easily squashed; Liquid – Flows, holds volume, not easily squashed and Gas – Expands, volume changes, easily squashed.                      Knows the term water cycle and can describe condensation as water vapour changing state into visible water droplets (cloud) and that those droplets fall as rain (precipitation) when get too heavy.                      Know that evaporation is when water (liquid) changes state to a gas.</p>	





Sound		Term: 5	Year: 4
<p><b>Foundations of previous learning:</b>                      Label body parts (ears). Link to senses (Animals; yr1)                      Know living features (sensitivity) (Living Things; yr2)                      Differences between solid, liquid &amp; gas (Materials; yr2)                      Energy can be transferred (light; yr3. Electricity; yr4)                      Matter is made from particles (Rocks; yr3)                      Particles move faster with more energy (States of Matter; yr4)                      Energy can transfer between particles (States of matter; yr4)</p>			
<b>Unit Learning</b>			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
Identify how sounds are made, associating some of them with something vibrating  Recognise that vibrations from sounds travel through a medium to the ear.  Find patterns between the pitch of a sound and features of the object that produced it  Find patterns between the volume of a sound and the strength of the vibrations that produced it.  Recognise that sounds get fainter as the distance from the sound source increases	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 2px solid yellow; padding: 5px; margin-bottom: 10px; text-align: center;">I remember &amp; use science words correctly</div> <div style="border: 2px solid yellow; padding: 5px; margin-bottom: 10px; text-align: center;">I use science models to describe</div> <div style="border: 2px solid yellow; padding: 5px; text-align: center;">I annotate diagrams to help describe &amp; explain</div> </div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 2px solid pink; padding: 5px; margin-bottom: 10px; text-align: center;">I predict a trend (relationship prediction)</div> <div style="border: 2px solid pink; padding: 5px; margin-bottom: 10px; text-align: center;">I plan investigations by selecting variables to change</div> <div style="border: 2px solid pink; padding: 5px; text-align: center;">I suggest a data range &amp; interval for the cause variable</div> </div>	Identify how sounds are made (sound energy, vibrations) Sound energy/vibrations travel from a source, through a medium (solid, liquid or gas), to your ear. The volume of a sound is linked to the strength of vibrations (sound energy) that produces it. Distance away from the source affects the volume of sound. The pitch of a sound is linked to the frequency of vibrations (sound energy) that produces it.	Sound energy transfer source ear particles solid liquid gas vibration volume decibels frequency pitch Hertz reflected transmitted absorbed fainter / louder lower / higher variable cause effect prediction comparative test fair test pattern method relationship trend data range data interval
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>Alexander Graham Bell</b> (1847-1922) Invented the telephone in 1876. His mother &amp; his wife were both deaf. He supported hearing education all his life.</p> 	Explaining science Designing experiments (See SLS Assessment boards)	Know how sounds are made. Sound energy is transferred by vibrating and colliding particles away from a sound source to your ear. Know that sound travels through solids, liquids and gases at different speeds. Know that the bigger the energy/size of vibrations, the bigger the volume we hear. Know that the bigger the energy/frequency of vibrations, the higher the pitch we hear.	


Animals including humans (5)		Term: 1	Year: 5/6 Cycle A	
<b>Foundations of previous learning:</b> Describes processes of life – reproduction, growth (Living Yr2) Knows plant life cycle. Sexual reproduction (Plants Yr2/3) Knows human life cycle. Growth creates change (Animals Yr2) Know mammals give birth to live young (Living Things Yr4)				
Unit Learning				
NC Objective - Coverage	Skills	Knowledge	Vocabulary	
Describe the changes as humans develop to old age (link to school policy on sex education)	<b>Year 5</b> I begin to use complex science words correctly I use science models to describe & begin to explain I begin to create & annotate my own 2D/3D diagrams <b>Year 6</b> I use complex science words correctly (growing fluency) I use science models to describe & explain I create & annotate my own 2D/3D diagrams	<b>Year 5</b> I use a frame to construct a complex table of results I use a frame to construct a graph & scale axes with help I join plotted coordinates with straight lines <b>Year 6</b> I construct a complex table to show repeated readings I construct a graph & scale one axis independently I plot mean value coordinates & draw a trend line	Order and compare the stages in the human life cycle. Understand and describe the changes as humans develop to old age. Describe the changes experienced in puberty. Understand why puberty happens. Compare gestation time in animals.	Offspring baby toddler child adolescent adult geriatric growth puberty fertilisation gestation birth egg sperm gamete embryo foetus periods pubic hair testicle penis vagina uterus womb ovary breasts erection intercourse ejaculation metamorphosis table of results cause effect repeats bar chart coordinate graph data point scale plot mean trend line
Key Scientist	Assessment of Skills	Assessment of Knowledge		
<b>David Sinclair</b> (1969-) World's leading scientist on human aging. Discovered the role of our DNA's body clock in causing aging and ways to slow aging down in mice through gene therapy. 	Explaining science Data, Tables and Graphs (See SLS Assessment boards)	Know and describe the stages in the human life cycle from birth to old age. Know the physical changes experienced in puberty. Know why it happens. Describes what happens during fertilisation and can compare and explain patterns in gestation times in mammals.		


Properties and changes of material		Term: 2	Year: 5
<p><b>Foundations of previous learning:</b>                      Properties (light Yr3; Forces Yr3/5; Electricity Yr4; Sound Yr4)                      Particles move (vibrate; collisions) with energy (Sound Yr4)                      Particles move faster with more energy (Sound Yr4)                      Know properties of solid, liquid &amp; gas (MaterialYr2; StatesYr4)                      Can use Particle Model to describe reversible changes in states of matter. Know associated complex terminology (States Yr4)                      Heat increases the rate of evaporation (States Yr4)</p>			
Unit Learning			
NC Objective - Coverage	Skills	Knowledge	Vocabulary
<p>Compare and group together everyday materials on the basis of properties (e.g. their hardness, solubility, transparency, conductivity (electrical/thermal) and response to magnets</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>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</p>	<p><b>Year 5</b></p> <p>I begin to use complex science words correctly</p> <p>I use science models to describe &amp; begin to explain</p> <p>I begin to create &amp; annotate my own 2D/3D diagrams</p> <p><b>Year 6</b></p> <p>I use complex science words correctly (growing fluency)</p> <p>I use science models to describe &amp; explain</p> <p>I create &amp; annotate my own complex 2D/3D diagrams</p> <p><b>Year 5</b></p> <p>I use K&amp;U to explain predictions (relationship)</p> <p>I plan investigations &amp; ensure controlled variables kept same</p> <p>I design &amp; write an ordered method (control variables)</p> <p><b>Year 6</b></p> <p>I reason K&amp;U to make hypothesis (relationship)</p> <p>I plan a reliable investigation (use variable terminology)</p> <p>I design &amp; write an ordered reliable method (repeats)</p>	<p>Compare and Group materials based on their properties. Give reasons (from evidence) for uses of these materials. A mixture is made up of 2 or more substances (particles mix). A solute (solid) dissolves in a solvent (liquid) to form a solution. A solution and other mixtures can be separated through evaporating, filtering, sieving and chromatography. Dissolving, mixing and changes in state are reversible changes. Some changes form new materials (compounds) through chemical reactions. These are irreversible reactions.</p>	<p>Material particle substance mixture compound state solid liquid gas melting boiling evaporation condensation freezing energy attraction dissolve (dissolving) solute solvent soluble (solubility) insoluble opaque translucent transparent (transparency) conductive (conductivity) insulating (insulation) heat temperature thermal</p> <p>flexible (flexibility) rigid (rigidity) elastic (elasticity) absorbent (absorbency) magnetic filtration sieving permeable (permeability) chromatography chemical physical reaction bond (bonded) combined reversible irreversible variable cause effect independent variable dependent variable controlled variable data range data interval repetition reliability risk relationship</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge	
<p><b>Spencer Silver</b> (1941-1921) American scientist that developed the low-tack glue that Arthur Fry later used to create his Post-It Notes in 1974. Silvers glue allowed stick-stick without leaving a residue.</p> 	<p>Explaining science Designing experiments (See SLS Assessment boards)</p>	<p>Know the comparative properties and uses of a range of materials. Know how mixtures and solutions form. Know how we can separate these. Know and describe both reversible and irreversible changes.</p>	


Science Curriculum

Forces		Term: 3	Year: 5/6 Cycle A
<p><b>Foundations of previous learning:</b>            Some forces need contact (contact forces) between two objects and some forces act at a distance (non-contact forces).            Recognise &amp; name contact (push, pull &amp; friction) / non-contact (gravity &amp; magnetic) forces (Forces Yr1/3)            Forces changes the direction &amp; speed of a moving object. More force more change. Use Force Arrow Model (Forces Yr1/3)            Particle Model to describe solids, liquids &amp; gases (States Yr4)</p>			
Unit Learning			
NC Objective - Coverage	Skills		Vocabulary
<p>Explain that unsupported objects fall towards the earth because of the force of gravity acting between earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognize that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</p>	<p><b>Year 5</b></p> <p>I begin to use complex science words correctly</p> <p>I use science models to describe &amp; begin to explain</p> <p>I begin to create &amp; annotate my own 2D/3D diagrams</p> <p><b>Year 6</b></p> <p>I use complex science words correctly (growing fluency)</p> <p>I use science models to describe &amp; explain</p> <p>I create &amp; annotate my own 2D/3D diagrams</p>	<p><b>Year 5</b></p> <p>I use a frame to construct a complex table of results</p> <p>I use a frame to construct a graph &amp; scale axes with help</p> <p>I join plotted coordinates with straight lines</p> <p><b>Year 6</b></p> <p>I construct a complex table to show repeated data</p> <p>I construct a graph &amp; scale at least one axis independently</p> <p>I plot mean value coordinates &amp; draw a trend line</p>	<p><i>Opposing forces can be in balance or unbalanced.</i>            Unsupported objects fall towards earth because of gravity force acting between earth and the falling object.            Air resistance force (gas) water resistance force (liquid) and friction force (solid) act between moving surfaces.            (Ideas about weight and acceleration due to gravity force could be described but should be left to KS3).            Levers, pulleys and gears allow a smaller force to have a greater effect (force multipliers).</p> <p>Force            force arrow            contact force            non-contact force            push force            pull force            twist force            friction force            upthrust force            reaction force            gravity force            air resistance force            water resistance force            particle            solid            liquid            gas            balanced            unbalanced            resultant force            force meter            Newton (N)            mass            weight            machine            lever (type 1, 2 &amp; 3)            pivot            fulcrum</p> <p>effort            load            pulley            mechanical advantage            force multiplier            gear            cog            turning force            speed            acceleration            table of results            cause            effect            repeats            bar chart            bar            coordinate            graph            data point            extrapolate            scale            plot            mean            trend line</p>
Key Scientist	Assessment of Skills		Assessment of Knowledge
<p><b>Galileo Galilei</b> (1564-1664) Italian scientist who suggested that the speed of a falling object is independent of its mass – due to gravity force. This was famously proved right by astronauts on the moon.</p> 	<p>Explaining science            Data, tables and graphs            (See SLS Assessment boards)</p>	<p>Know that opposing forces can be in balance or unbalanced (cause change).            Know that contact forces such as friction and air/water resistance act to slow moving objects down.            Know that gravity force (non-contact) pulls objects towards earth.            Levers, pulleys and gears act as force multipliers (reduce force needed).</p>	

Earth and Space		Term: 4	Year: 5/6 Cycle A	
<p><b>Foundations of previous learning:</b>                      Describes path/transfer of light energy (Model) (Light Yr3)                      Reflected light energy (shiny/dull) path to eye (Light Yr3)                      Sun moves across the sky. Day-length (Seasons/Light Yr1/3)                      Non-contact (gravity &amp; magnetic) forces (Forces Yr1/3/5)                      Forces changes the direction &amp; speed of a moving object. Balanced/unbalanced. Use Force Arrow Model (Forces Yr1/3/5)</p>				
Unit Learning				
NC Objective - Coverage	Skills	Knowledge	Vocabulary	
<p>Describe the movement of the earth, and other planets, relative to the sun in the solar system</p> <p>Describe the movement of the moon relative to the earth</p> <p>Describe the sun, earth and moon as approximately spherical bodies</p> <p>Use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky</p>	<p><b>Year 5</b></p> <p>I begin to use complex words correctly</p> <p>I use science models to describe &amp; begin to explain</p> <p>I begin to create &amp; annotate my own 2D/3D diagrams</p> <p><b>Year 6</b></p> <p>I use complex science words correctly (growing fluency)</p> <p>I use science models to describe &amp; explain</p> <p>I create &amp; annotate my own 2D/3D diagrams</p>	<p><b>Year 5</b></p> <p>I describe patterns, trends &amp; relationships</p> <p>I use data in conclusions &amp; science models to explain</p> <p><b>Year 6</b></p> <p>I describe changing patterns, trends &amp; relationships</p> <p>I use primary &amp; secondary data in my conclusions</p>	<p>The sun, planets and moon(s) are spherical bodies.</p> <p>Can describe the development of a heliocentric model of the solar system. The Earth &amp; other planets orbit the sun in the Solar System.</p> <p>Know the order of planets in our solar system. Can describe how planets rotate (day/night) and orbit the sun (seasons). Big Picture.</p> <p>Day and night are caused by the Earth's rotation (sun appears to move across the sky).</p> <p>The moon orbits the Earth. Know the phases of the moon.</p>	<p>Solar system</p> <p>sun</p> <p>star</p> <p>planet</p> <p>Mercury</p> <p>Venus</p> <p>Earth</p> <p>Mars</p> <p>Jupiter</p> <p>Saturn</p> <p>Uranus</p> <p>Neptune</p> <p>Pluto</p> <p>Asteroids</p> <p>moon</p> <p>orbit</p> <p>ellipses</p> <p>gravity force</p> <p>temperature</p> <p>solid</p> <p>liquid</p> <p>gas</p> <p>axis</p> <p>tilted axis</p> <p>day</p> <p>night</p> <p>month</p> <p>year</p> <p>satellite</p> <p>atmosphere</p> <p>surface</p> <p>new moon</p> <p>full moon</p> <p>quarter moon</p> <p>waxing</p> <p>waning</p> <p>crescent</p> <p>gibbous</p> <p>energy</p> <p>transfer</p> <p>Universe</p> <p>telescope</p> <p>astronomy</p> <p>heliocentric</p> <p>pattern</p> <p>data</p> <p>primary data</p> <p>secondary data</p> <p>trend</p> <p>relationship</p> <p>conclusion</p> <p>valid (validity)</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge		
<p><b>Stephen Hawking</b> (1942-2014) English scientist who suffered from motor neurone disease. He was one of our greatest scientists who studied black holes and popularised science through many books.</p> 	<p>Explaining science</p> <p>Making conclusions</p> <p>(See SLS Assessment boards)</p>	<p>Know that the Sun is at the centre of our Solar System. Earth and other planets orbit the Sun.</p> <p>Know the order of planets in our Solar System from the Sun outwards.</p> <p>Know and can explain why we have day &amp; night and seasons on Earth.</p> <p>Know our moon orbits the Earth. Know and can explain the phases of the moon in a Lunar Cycle.</p>		


Animals Including Humans (6)		Term: 5	Year: 5/6 Cycle A
<p><b>Foundations of previous learning:</b>                      Needs – food, air / exercise / hygiene (Animals Yr2)                      Processes of life – respiration, nutrition, excretion (Living Yr2)                      Digestive system organs and function – absorption in small intestine; muscles need oxygen (energy) (Animals Yr3)                      Nutrition from food; food types (energy); uses (Animals Yr3)                      Solids, liquids &amp; gases; changes (States of matter Yr4)                      Dissolve to form solutions; mixtures; reactions (Materials Yr5)</p>			
Unit Learning			
NC Objective - Coverage	Skills		Vocabulary
<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans</p>	<p><b>Year 5</b></p> <p>I begin to use complex science words correctly</p> <p>I use science models to describe &amp; begin to explain</p> <p>I begin to create &amp; annotate my own 2D/3D diagrams</p> <p><b>Year 6</b></p> <p>I use complex science words correctly (growing fluency)</p> <p>I use science models to describe &amp; explain</p> <p>I create &amp; annotate my own 2D/3D diagrams</p>	<p><b>Year 5</b></p> <p>I use K&amp;U to explain predictions (relationship)</p> <p>I plan an investigation &amp; ensure controlled variables kept same</p> <p>I suggest data range, interval &amp; sufficient readings</p> <p><b>Year 6</b></p> <p>I reason K&amp;U to make a hypothesis (relationship)</p> <p>I plan a reliable investigation (use variable terminology)</p> <p>I collect repeated readings (&gt;3) &amp; calculate mean</p>	<p>Name the main parts of the human circulatory system. Describe the functions of the heart (structure), blood vessels (artery, vein &amp; capillaries) &amp; blood (components)</p> <p>Understand &amp; describe the double circulatory system of humans (Big-Picture Model – using the parts above) to describe the way water, nutrients &amp; oxygen are transported in animals</p> <p>Know the impact of diet, exercise, drugs &amp; lifestyle on the way our bodies function</p>
			<p>Circulation (circulatory)</p> <p>heart</p> <p>atrium (atria)</p> <p>ventricle (ventricles)</p> <p>valve</p> <p>vessel</p> <p>artery</p> <p>vein</p> <p>capillary</p> <p>blood</p> <p>red blood cell</p> <p>white blood cell</p> <p>platelets</p> <p>plasma</p> <p>lungs</p> <p>oxygen</p> <p>oxygenated</p> <p>deoxygenated</p> <p>carbon dioxide</p> <p>nutrients</p> <p>obesity</p> <p>exchange</p> <p>exercise</p> <p>pulse</p> <p>recovery time</p> <p>drugs (various)</p> <p>variable</p> <p>cause</p> <p>effect</p> <p>independent variable</p> <p>dependent variable</p> <p>controlled variable</p> <p>data range</p> <p>data interval</p> <p>repetition</p> <p>reliability</p> <p>risk</p> <p>relationship prediction</p> <p>hypothesis</p> <p>method</p> <p>precision</p> <p>error</p>
Key Scientist	Assessment of Skills		Assessment of Knowledge
<p><b>William Harvey</b> (1578-1657) English doctor that used dissection to discover that blood circulates in the body and is pushed by the heart. He also describes the action of heart chambers and valves.</p> 	<p>Explaining science</p> <p>Designing experiments</p> <p>(See SLS Assessment boards)</p>		<p>Name &amp; describe functions of blood, heart &amp; vessels (circulatory system).</p> <p>Know and describe the human double circulatory system in the transport of water, nutrients and oxygen around the body.</p> <p>Know the impact of diet, exercise, drugs &amp; lifestyle on our body functions.</p>


Living things and their habitats (5)		Term: 1	Year: 5/6 Cycle B	
<p><b>Foundations of previous learning:</b>                      Animal (human) &amp; plant life cycles (PlantsYr2/3, AnimalsYr2/5)                      Sexual reproduction (pollination) in plants (Plants Yr3)                      Classification as vertebrate &amp; invertebrates (Living Things Yr4)                      Sampling &amp; species identification (Plants Yr1, Living Yr2/4)</p>				
Unit Learning				
NC Objective - Coverage	Skills	Knowledge	Vocabulary	
<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals (sexual/asexual)</p>	<p><b>Year 5</b></p> <div style="border: 1px solid black; background-color: yellow; padding: 2px; margin-bottom: 5px;">I begin to use complex science words correctly</div> <div style="border: 1px solid black; background-color: yellow; padding: 2px; margin-bottom: 5px;">I use science models to describe &amp; begin to explain</div> <div style="border: 1px solid black; background-color: yellow; padding: 2px; margin-bottom: 5px;">I begin to create &amp; annotate my own 2D/3D diagrams</div> <p><b>Year 6</b></p> <div style="border: 1px solid black; background-color: yellow; padding: 2px; margin-bottom: 5px;">I use complex science words correctly (growing fluency)</div> <div style="border: 1px solid black; background-color: yellow; padding: 2px; margin-bottom: 5px;">I use science models to describe &amp; explain</div> <div style="border: 1px solid black; background-color: yellow; padding: 2px; margin-bottom: 5px;">I create &amp; annotate my own 2D/3D diagrams</div>	<p><b>Year 5</b></p> <div style="border: 1px solid black; background-color: pink; padding: 2px; margin-bottom: 5px;">I use K&amp;U to explain prediction (relationship)</div> <div style="border: 1px solid black; background-color: pink; padding: 2px; margin-bottom: 5px;">I plan investigations &amp; ensure controlled variables kept same</div> <div style="border: 1px solid black; background-color: pink; padding: 2px; margin-bottom: 5px;">I design &amp; write an ordered method (control variables)</div> <p><b>Year 6</b></p> <div style="border: 1px solid black; background-color: pink; padding: 2px; margin-bottom: 5px;">I reason K&amp;U to make hypothesis (relationship)</div> <div style="border: 1px solid black; background-color: pink; padding: 2px; margin-bottom: 5px;">I plan a reliable investigation (use variable terminology)</div> <div style="border: 1px solid black; background-color: pink; padding: 2px; margin-bottom: 5px;">I design &amp; write an ordered reliable method</div>	<p>Describe the similarity and differences in the life cycles of mammals, amphibians, birds and insects. Compare &amp; contrast.                      Research life cycles of plants, invertebrates &amp; vertebrates within local habitats. Be able identify &amp; describe changes over time.                      Describe the life process of reproduction in plants &amp; animals.                      O Sexual – fertilisation leading to variation                      O Asexual – vegetative growth leading to clones</p>	<p>Sexual                      asexual                      growth                      metamorphosis                      puberty                      reproduction                      fertilisation                      (internal / external)                      gamete                      egg                      sperm                      embryo                      foetus                      larva                      pupa (chrysalis)                      testes                      uterus                      gestation                      birth                      petals                      sepals                      carpel                      stigma                      ovary                      anther                      stamen                      pollen</p> <p>pollination                      dispersal                      vegetative                      bulb                      runner                      tuber                      rhizome                      corm                      stem                      root                      variation                      clone                      independent variable                      dependent variable                      controlled variable                      data range                      data interval                      repetition                      reliability                      risk                      relationship prediction                      hypothesis                      method                      scale</p>
Key Scientist	Assessment of Skills	Assessment of Knowledge		
<p><b>Maria Sybilla Merian</b> (1647-1717) German scientist who was the first to observe, record and name to process of insect metamorphosis in silk worms. She built on Swammerdam’s research.</p> 	<p>Explaining science                      Designing experiments                      (See SLS Assessment boards)</p>	<p>Know and compare the life cycles of a mammal, amphibian, insect and a bird.                      Know the process of sexual reproduction in plants and animals.                      Know the process of asexual reproduction in plants and animals.</p>		

Evolution and inheritance		Term: 2	Year: 5/6 Cycle B	
<b>Foundations of previous learning:</b> Plant life cycle and reproduction; fertilisation (Plants Yr3) Fossil formation & timelines (Rocks Yr3) Biodiversity, environmental pressure, adaptation (Living Yr4)		Human life cycle; puberty, gametes & fertilisation (Animals Yr5) Life cycles; (a)sexual reproduction, adaptation (Living Yr5) Classification system; inherited features; species (Living Yr6) Species diversity & idea of evolution (Living Things Yr4/5/6)		
Unit Learning				
NC Objective - Coverage	Skills	Knowledge	Vocabulary	
Recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago.  Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.  Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	<b>Year 5</b> I begin to use complex science words correctly  I use science models to describe & begin to explain  I begin to create & annotate my own 2D/3D diagrams  <b>Year 6</b> I use complex science words correctly (growing fluency)  I use science models to describe & explain  I create & annotate my own 2D/3D diagrams	<b>Year 5</b> I use a frame to construct a complex table of results  I use a frame to construct a graph & scale axes with help  I join plotted coordinates with straight lines  <b>Year 6</b> I construct a complex table to show repeated data  I construct a graph & scale at least one axis independently  I plot mean value coordinates & draw a trend line	Living things can produce identical offspring (asexual) but sexual reproduction results in offspring that, although share inherited features, may vary (not identical) from their parents. Know some inherited features  This variation means that some individuals will have features better suited to a changing environment. These better features will be selected for by nature, and so, individuals that have them are more likely to survive.  Natural selection is the process where species adapt to their environment. It is the engine that drives evolution. Know how some species are adapted  Fossil evidence shows how living things have changed over time	Inherit (inheritance) variation asexual sexual reproduction sperm egg cell nucleus gene characteristic feature trait environment parent offspring selection (selected) adapt (adaptation) species evolution  fossil extinct (extinction) survival table of results cause effect repeats bar chart bar coordinate graph data point extrapolate scale plot mean trend line linear non-linear
Key Scientist	Assessment of Skills	Assessment of Knowledge		
<b>Alfred Russell Wallace</b> (1823-1913) Welsh scientist independently developed that natural selection drove evolution. He collaborated with Darwin and this competition made Darwin write 'Origin of species'. 	Explaining science Data, table and graphs (See SLS Assessment boards)	Know that sexual reproduction results in variation for inherited features. Variation in features allows for natural selection, adaptation and evolution. Know how a range of animals & plants are adapted to their environment. Know that the fossil evidence shows a record of extinct living things & how living things/the climate have changed over time.		




Science Curriculum

Electricity		Term: 3	Year: 5/6 Cycle B	
<b>Foundations of previous learning:</b> Identify electric dangers & stay safe (Circuits; yr2) Construct a wide range of series circuits (Electricity; yrs 2/4) Identify and draw components (Electricity; yrs 2/4)		Knows a switch 'opens' and 'closes' a circuit (Electricity; yr4) Recognises and solves simple errors in circuits (Electricity; yr4) Electrical insulators/conductors (Electricity yr4; Materials yr5) Energy is transferred (Light yr3; Sound yr4; Electricity yr4)		
Unit Learning				
NC Objective - Coverage	Skills		Vocabulary	
Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit  Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches  Use recognised symbols when representing a simple circuit in a diagram	<b>Year 5</b> I begin to use complex science words correctly  I use science models to describe & begin to explain  I begin to create & annotate my own 2D/3D diagrams  <b>Year 6</b> I use complex science words correctly (growing fluency)  I use science models to describe & explain  I create & annotate my own 2D/3D diagrams	<b>Year 5</b> I use K&U to explain predictions (relationship)  I plan investigations & ensure controlled variables kept same  I begin to plan to minimise risk & work safely  <b>Year 6</b> I reason K&U to make a hypothesis (relationship)  I plan reliable investigations (use variable terminology)  I plan to minimise risk & describe safe use	Confidently draw a range of series circuits using symbols. Link the brightness of a bulb / volume of a buzzer to the number & Voltage of cells used in the battery. <i>Measure Voltage.</i> Explain changes in brightness / volume <i>using the Energy Transfer Model</i> (link to Voltage). Explain the action of a switch. <i>Begin to explain component 'failure' by resistance to electrical flow (energy transfer out of the circuit as heat energy). Begin to describe electrical flow as Current.</i>	Electric (electricity) source energy transfer Voltage flow Current resistance insulator conductor closed / open circuits series cell battery positive negative wire bulb buzzer motor switch clip metal  light energy sound energy heat energy kinetic energy Voltmeter  variable cause effect independent variable dependent variable controlled variable data range data interval repetition reliability risk relationship prediction hypothesis method precision error
Key Scientist	Assessment of Skills		Assessment of Knowledge	
<b>Georg Ohm</b> (1789-1854) German scientist who discovered the relationship between voltage, current and resistance in a circuit. He developed Ohm's Law and the unit of resistance is named after him. 	Explaining science Designing experiments (See SLS Assessment boards)		Confidently construct/draw a range of series circuits with correct symbols. Link 'effect' (brightness/loudness) with the voltage of battery cells used. Explain variations in how components function in a range of series circuits. Begins to explain component 'failure' due to electrical resistance.	

Living things and their habitats (6)		Term: 4	Year: 5/6 Cycle B	
<b>Foundations of previous learning:</b> Identify local plants & animals by sight (Plants; Animals Yr1/4) Grouping & use of keys to identify (Living things Yr4) Define/identify carnivore, herbivore & omnivore (Animals Yr1) Requirements for plant/animal growth (Plants; Animals Yr2/3)		Life cycle of plants & animals (Plants; Animals Yr2/3/5) Describe habitats & micro-habitats (Living things Yr2) Food chains (transfer food/energy) (Living Yr2; Animals Yr4) Measure & change biodiversity (random sampling) (Living Yr4)		
Unit Learning				
NC Objective - Coverage	Skills	Knowledge	Vocabulary	
Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals  Give reasons for classifying plants and animals based on specific characteristics.	<p><b>Year 5</b></p> <p>I construct spider keys &amp; use number keys</p> <p>I group &amp; sub-group by easy observations</p> <p><b>Year 6</b></p> <p>I construct both spider &amp; number keys</p> <p>I group &amp; sub-group by fine observations</p>	<p><b>Year 5</b></p> <p>I use K&amp;U to explain my relationship prediction</p> <p>I plan investigations &amp; ensure controlled variables are same</p> <p>I begin to plan to minimise risk &amp; work safely</p> <p><b>Year 6</b></p> <p>I reason K&amp;U to make a hypothesis (relationship)</p> <p>I plan reliable investigations (variable terminology)</p> <p>I plan to minimise risk &amp; describe safe equipment use</p>	Living things are classified into broad groups according to observable features (binomial naming system). Reasons for classifying. There are five Kingdoms of living things. Know the binomial naming System. Can use & construct classification Keys. Know how to sample a habitat for species diversity (biodiversity). Measure species richness, abundance & evenness. Measure abiotic factors over time. Manage/plan change to encourage biodiversity. Micro-organisms include bacteria and fungi.	Classification taxonomy characteristic diversity variation Kingdom phylum class order family genus species binomial animal plant fungi Protista (single-celled) Monera (bacteria) virus vertebrate invertebrate agar
<b>Key Scientist</b>	<b>Assessment of Skills</b>	<b>Assessment of Knowledge</b>		
Carl Linnaeus (1707-1778) Swedish scientist developed the binomial classification system that is still used today. He used observable characteristics to order living things into increasingly similar groups. 	Classification Designing experiments (See SLS Assessment boards)	Know living things are classified into groups according to observable features (binomial system). There are 5 kingdoms of living thing. Know how to sample a habitat for species diversity and abiotic factors. Know that microbes include bacteria and fungi.		

Science Curriculum

Light		Term: 5	Year: 5/6 Cycle B	
<b>Foundations of previous learning:</b> Identify light sources (natural & man-made) (Light Yr1/3) Describes path/transfer of light energy (Model) (Light Yr3)		Reflected light energy (shiny/dull). Transmitted (transparent, translucent & opaque) (Materials Yr1/2/5, Light Yr1/3) Sun across the sky. Day-length (Seasons/Light Yr1, Space Yr5) Opaque materials form shadows. Absence of transmitted light energy. Can change length & size of a shadow (Light 1/3).		
Unit Learning				
NC Objective - Coverage	Skills	Knowledge	Vocabulary	
recognise that light appears to travel in straight lines  use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye  explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes  use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	<p><b>Year 5</b></p> <p>I begin to use complex science words correctly</p> <p>I use science models to describe &amp; begin to explain</p> <p>I begin to create &amp; annotate my own 2D/3D diagrams</p> <p><b>Year 6</b></p> <p>I use complex science words correctly (growing fluency)</p> <p>I use science models to describe &amp; explain</p> <p>I create &amp; annotate my own 2D/3D diagrams</p>	<p><b>Year 5</b></p> <p>I describe patterns, trends &amp; relationships</p> <p>I use data in my conclusions &amp; science models to explain</p> <p>I identify strengths, weaknesses &amp; improvements</p> <p><b>Year 6</b></p> <p>I describe changing patterns, trends &amp; relationships</p> <p>I use primary &amp; secondary data in my conclusions</p> <p>I suggest limitations (data) &amp; practical improvements</p>	Light travels in straight lines from a light source (Energy Transfer Model) directly, reflects, goes through a material or is absorbed. Light travels in straight lines from a light source directly into the eye (represent this using a light ray diagram) Light travels in straight lines from a light source to an object and reflected into the eye (represent using a light ray diagram) Know the angle of incidence is equal to the angle of reflection. Explain the size and shape of a shadow knowing that light travels in straight lines (represent using a light ray diagram)	Light source energy transfer reflection (reflected) transmits (transmitted) absorbs (absorbed) shiny dull mirror transparent translucent opaque ray eye receptor shadow angle incidence perpendicular pattern data primary data secondary data trend relationship conclusion valid (validity) limitation
Key Scientist	Assessment of Skills	Assessment of Knowledge		
<p><b>Albert Einstein</b> (1879-1955) German-born scientist who proposed light was neither a particle nor a wave, but a 'photon' of energy. Developed theory of relativity that the speed of light is independent.</p> 	Explaining science Making conclusions (See SLS Assessment boards)	Know that light energy travels in straight lines from a source directly, reflects off a surface, goes through a material or is absorbed. Use a light ray diagram to show light transfer from a source to the eye. We see things when light travels directly or is reflected into our eyes. Explains & predicts the size & shape of a shadow knowing that light travels in straight lines. The shadow is the same shape as the object that cast it.		



## Key stage 1 programme of study – years 1 and 2

### Working scientifically

#### Statutory requirements

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions.



## Year 1 programme of study

### Plants

#### Statutory requirements

Pupils should be taught to:

- identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
- identify and describe the basic structure of a variety of common flowering plants, including trees.

## Animals, including humans

### Statutory requirements

Pupils should be taught to:

- identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
- identify and name a variety of common animals that are carnivores, herbivores and omnivores

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### Science – key stages 1 and 2

### Statutory requirements

- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.



## Everyday materials

### Statutory requirements

Pupils should be taught to:

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties.

## Seasonal changes

### Statutory requirements

Pupils should be taught to:

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies.

## Year 2 programme of study

### Living things and their habitats

#### Statutory requirements

Pupils should be taught to:

- explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including micro-habitats
- 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.

## Plants

### Statutory requirements

Pupils should be taught to:

- observe and describe how seeds and bulbs grow into mature plants
- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

## Animals, including humans

### Statutory requirements

Pupils should be taught to:

- notice that animals, including humans, have offspring which grow into adults
- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

## Uses of everyday materials

### Statutory requirements

Pupils should be taught to:

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

## Lower key stage 2 programme of study

### Working scientifically

#### Statutory requirements

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

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

## Year 3 programme of study

### Plants

#### Statutory requirements

Pupils should be taught to:

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant
- investigate the way in which water is transported within plants
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

## Animals, including humans

### Statutory requirements

Pupils should be taught to:

- identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
- identify that humans and some other animals have skeletons and muscles for support, protection and movement.

## Rocks

### Statutory requirements

Pupils should be taught to:

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



## Light

### Statutory requirements

Pupils should be taught to:

- recognise that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by an opaque object
- find patterns in the way that the size of shadows change.

## Forces and magnets

### Statutory requirements

Pupils should be taught to:

- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing.

## Year 4 programme of study

### Living things and their habitats

#### Statutory requirements

Pupils should be taught to:

- recognise that living things can be grouped in a variety of ways
- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- recognise that environments can change and that this can sometimes pose dangers to living things.

## **Animals, including humans**

### **Statutory requirements**

Pupils should be taught to:

- describe the simple functions of the basic parts of the digestive system in humans
- identify the different types of teeth in humans and their simple functions
- construct and interpret a variety of food chains, identifying producers, predators and prey.

## States of matter

### Statutory requirements

Pupils should be taught to:

- compare and group materials together, according to whether they are solids, liquids or gases
- observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius ( $^{\circ}\text{C}$ )
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

## Sound

### Statutory requirements

Pupils should be taught to:

- identify how sounds are made, associating some of them with something vibrating
- recognise that vibrations from sounds travel through a medium to the ear
- find patterns between the pitch of a sound and features of the object that produced it
- find patterns between the volume of a sound and the strength of the vibrations that produced it
- recognise that sounds get fainter as the distance from the sound source increases.

## Electricity

### Statutory requirements

Pupils should be taught to:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors.

## Upper key stage 2 programme of study

### Working scientifically

#### Statutory requirements

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments.



## Year 5 programme of study

### Living things and their habitats

#### Statutory requirements

Pupils should be taught to:

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- describe the life process of reproduction in some plants and animals.

### Animals, including humans

#### Statutory requirements

Pupils should be taught to:

- describe the changes as humans develop to old age.

## Properties and changes of materials

### Statutory requirements

Pupils should be taught to:

- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

## Earth and space

### Statutory requirements

Pupils should be taught to:

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

## Forces

### Statutory requirements

Pupils should be taught to:

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

## Year 6 programme of study

### Living things and their habitats

#### Statutory requirements

Pupils should be taught to:

- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
- give reasons for classifying plants and animals based on specific characteristics.

## Animals including humans

### Statutory requirements

Pupils should be taught to:

- identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- describe the ways in which nutrients and water are transported within animals, including humans.

## Evolution and inheritance

### Statutory requirements

Pupils should be taught to:

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

## Light

### Statutory requirements

Pupils should be taught to:

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.



## Electricity

### Statutory requirements

Pupils should be taught to:

- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- use recognised symbols when representing a simple circuit in a diagram.