












Science at Chacewater School

<p>Intent</p>	<p style="text-align: center;">“Science is discovering new things and how they work. We love science and feel excited and curious.” (Pupil Conferencing)</p> <p>At Chacewater school our aim is to develop a fun, practical and engaging high-quality curriculum that inspires the next generation to foster a love for science, so that they can succeed and excel throughout their life. We promote and celebrate scientific role models and science vocations to foster aspirations for their own future.</p> <p>Our progressive curriculum focuses both on scientific knowledge (substantive knowledge) and working scientifically (disciplinary knowledge) so that the pupils are able to build upon prior learning and make connections. In this way the pupils are able to develop transferable scientific skills.</p> <p>We provide hands-on, practical activities that enable and encourage the pupils to question, explore and discover the world around them. We follow specific lines of enquiry: observation over time; identifying, classifying and grouping; comparative and fair testing; use of secondary resources and pattern seeking. These are then linked to working scientifically skills.</p> <p>We have built our curriculum following the 3 strands of science: biology, chemistry and physics as a way of creating transition between the primary and secondary phase.</p> <p>Where possible, we utilise the outdoor space for wider learning, contextual learning and also develop community links to celebrate the importance of science in a number of fields.</p>
<p>Implementation</p>	<p>Chacewater School provides full coverage of the new National Curriculum, following the programmes of study for each year group carefully. It provides a balance between working scientifically (disciplinary skills) and learning scientific facts (substantive knowledge)</p> <p>The acquisition of key scientific knowledge is an integral part of our science lessons. In addition, where there is a thematic link we aim to maximise this for learning in context, but sometimes, where they don't exist naturally, the subject is taught discretely.</p> <p>Working scientifically skills are embedded into lessons to ensure these are being developed throughout the children's school career, and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in keeping with the themes. Each skill is taught through a line of enquiry. Symbols accompany each skill and enquiry, and are used throughout the school as a hook and reference. The progression of skills for working scientifically are developed through the year groups as shown on the planner with scientific enquiry skills being of key importance within lessons.</p>

LINES OF ENQUIRY



WORKING SCIENTIFICALLY SKILLS (KS1 focus on those highlighted)

PLAN			DO			REVIEW		
Ask scientific questions 	Plan an enquiry 	Make a prediction 	Observe closely 	Take measurements 	Gather/record results 	Present results 	Interpret results/draw conclusions 	Evaluate an enquiry 

We have developed knowledge organisers to enable children to learn and retain the important, useful and powerful vocabulary and knowledge contained within each unit. We also start each unit with some form of concept map or prior knowledge task, so that the children can build upon previous learning and also make fundamental connections. (identifying vertical links as well as horizontal) Misconceptions can also be picked up on and addressed.

Science books are passed onto the next year so that children can use these as aid memoirs and strengthen their scientific understanding across each unit, which also enables them to make connections between different areas in science.

Programmes of study are taught across the year and are a driver for the overall theme where appropriate: KS1 (4 programmes of study) KS2 (5 programmes of study). We make specific decisions on the plants/animals to study in each year group based in part on our locality, the seasons, prior knowledge and the link to our themes to ensure progression.

At Chacewater, teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards by putting theory into practice and the real world so that science is both powerful and purposeful. In order that all pupils can access the science curriculum, we consider the following: vary recording methods; use pre-teach sessions; reference and develop knowledge organisers and consider practical ways in which to promote

	and encourage high standards for all. In addition, floor books are used not only to record learning, but also as an aide memoire, which the children can actively use to support their learning and consolidate knowledge. These are also passed on to the next year so that pupils can refer back to previous learning and identify links across each theme.
Impact	<p>The successful approach to the teaching of science at Chacewater results in a fun, engaging, high- quality science education that provides children with the foundations for understanding the world around them, in order that they can take this inquisitiveness with them once they complete their primary education.</p> <p>In order to identify the impact of our science teaching and learning we incorporate the following: reviewing prior knowledge; quizlets; mini tests; the use of individual science books taken throughout the school for reference/establishing links; concept maps and the use of floor books, which the children use regularly to solidify their understanding. We use Target Tracker as a summative form of assessment to track progress.</p> <p>In addition we gather information about the impact of science. This includes: audits, pupils voice, staff input and development, book scrutinies and observations. Through these means we aim to establish that the children at Chacewater school:</p> <ul style="list-style-type: none"> ● demonstrate a love of science work and an interest in further study and work in this field ● retain knowledge that is pertinent to Science with a real life context. ● are able to question ideas and reflect on knowledge. ● are able to articulate their understanding of scientific concepts and be able to reason scientifically using rich language linked to science. ● demonstrate a high love of mathematical skills through their work, organising, recording and interpreting results. ● work collaboratively and practically to investigate and experiment. ● achieve age related expectations in Science at the end of their cohort year.

‘L E A P’ Into SCIENCE at Chacewater

<p><u>L</u>ocal</p> <p>How do we use our locality in this subject? Local links? Chacewater and Cornwall Community Links and visits for this subject? Opportunities to explore, investigate and enquire?</p>	<p>At Chacewater, from the beginning of school, pupils begin to explore their local area and use their locality to learn about and discover science. Some examples include:</p> <p>Exploring and classifying plants, animals and everyday materials in the local environment Comparing findings in more than one area (school field, the rec, Millennium Green) Trips, such as the local garden centre and Feadon Farm Collecting data and taking measurements in areas in and around school Visits: dentist, doctors, paramedics, vets etc We make specific decisions on the plants/animals to study in each year group based in part on our locality.</p>
<p><u>E</u>ngaging</p> <p>Memorable moments? Visits? People in school Hands on experiences? Choice of learning activities? Whole school events/themes National day and events?</p>	<p>Science should enable children to be “curious and excited” therefore we aim to provide many memorable moments for them. These include:</p> <p>Visits (examples being, a visit from paramedic who ran a information workshop about the heart and linked it to resuscitation and a visit from an animal handler) Investigations Explorations using the local environment Practical experiences - e/g. growing plants, pond dipping etc Use of KAGAN cooperative learning strategies Science Days and trips KS2/3 transitions and workshops Assemblies e.g a talk by Spaceport Cornwall employer</p>
<p><u>A</u>spiring & Ambitious</p> <p>How do we make this subject challenging and exciting? What do want outcomes to look like? Key questions?</p>	<p>We make Science challenging and exciting by the following:</p> <p>links to our theme where appropriate (E.g. volcanic eruptions using the chemical reaction of combining vinegar and bicarbonate of soda in Y5) using high quality resources using chrome books and ipads to explore and investigate use of video clips, photographs, real life objects (as well as STEM/Explorify resources etc) encourage child led, hand-on exploration and investigation (Do children with longer legs jump further? Can bigger hands grab more sweets?) explore jobs/careers in the real world linked to science - eg. Jacqueline Auriol, aviator.</p>

<p>How do we ensure there is diversity e.g. range of artists, authors, historical figures, famous scientists</p>	<p>learn about inspirational people in the world of science (role models) building upon prior knowledge and introducing aspirational vocabulary as appropriate a range of scientists and naturalists are studied: e.g. Charles Darwin, George Forrest, Astronauts (Tim Peak, Helen Sharman)</p>
<p><u>P</u>owerful & purposeful</p> <p>Sticky knowledge? How? What makes this subject memorable? Wider links - outside of our locality? Global issues? Cross curricular links Building in previous knowledge? How? Progression?</p>	<p>Our science curriculum shows clear progression in both knowledge and skills so that the pupils can retain and build upon their understanding, as well as establish links and connections. We have a number of strategies to support this including: recapping prior skills and knowledge knowledge organisers use of big books to reference and explore quizlets vocabulary is build upon incrementally and extended concept maps (to be added to as the pupils' knowledge develops) cross- curricular links where appropriate real world science - current news/world events (For example pupils learn about recent volcanic eruptions in Y5 and 'Save the bees' linked to pollination)</p>
<p><u>LINKS</u></p>	<p>https://www.stem.org.uk/primary-science https://explorify.uk/en/activities https://wordwall.net/en-us/community/games https://pstt.org.uk/resources/curriculum-materials/assessment https://get.plickers.com https://edu.rsc.org/primary-science/find-resources https://www.commonsense.org/education/top-picks/terrific-websites-for-science https://nearpod.com/library/</p>

Assessment Opportunities for Working Scientifically (disciplinary knowledge)

TAPS

<https://pstt.org.uk/resources/curriculum-materials/assessment>

Overview of TAPS plans for Focused Assessment of Working Scientifically

(Any focus can be chosen for open-ended enquiries, these are only suggestions)



	PLAN		DO		REVIEW	
	Ask Qs + plan enquiry	Set up enquiry	Observe + Measure	Record	Interpret + Report	Evaluate
R plans	Brown apples	Incy spider shelter	Frozen balloons	Scavenger sort	Butter	Taste test
KS1 (age 5-7) Develop close obs	Ask simple Qs and recognise that they can be answered in different ways*.	Perform simple tests	Observe closely, using simple equipment.	Gather and record data to help in answering questions.	Identify and classify. <i>Use appropriate scientific language to communicate ideas.</i>	Use their observations and ideas to suggest answers to questions.
Y1 TAPS plans	Materials: reflection test Materials: transparency	Materials: floating and sinking Teddy zipline	Plants: structure leaf look Shades of colour	Seasons: seasonal change Materials: Bridge testers	Animals inc Humans: animal classification	Animals inc Humans: body parts
Y2 TAPS plans	Materials: waterproof Separating colours	Materials: rocket mice Daisy footprints	Plants: compare growth Ice escape	Living things: woodlice habitats Materials hunt	Living things: nature spotters Living and nonliving	Animals inc H: handspans Materials: boat
LOWER KS2 (age 7-9) Develop systematic approach	Ask relevant questions and use different types* of scientific enquiries to answer them.	Set up simple practical enquiries, comparative and fair tests.	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment including thermometers and data loggers.	Gather, record, classify and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Identify differences, similarities or changes related to simple scientific ideas and processes.	Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Use straightforward scientific evidence to answer questions or to support their findings.
Y3 TAPS plans	Animals inc Humans: investigating skeletons Cupcake parachutes	Forces: shoe grip Forces: magnet tests	Plants: measuring plants Ice cream	Light: making shadows Forces: cars down ramps	Rocks: rock reports Eco Action	Plants: function of stem Forces: balloon rockets Materials: egg drop packaging
Y4 TAPS plans	Sound: investigating pitch Cornflour slime	Materials: drying materials	Materials: measure temp Electricity: Circuit products	Living things: local survey	Electricity: conductors Sound: string telephones	Animals inc H: teeth (eggs) in liq Materials: Dunking biscuits
UPPER KS2 (AGE 9-11) Develop independence	Plan different types* of scientific enquiries to answer <i>their own questions</i> , including recognising and controlling variables where necessary.	Use test results to make predictions to set up further comparative and fair tests.	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	Report and present findings from enquiries, inc conclusions and causal relationships, in oral and written forms such as displays and other presentations, <i>using appropriate scientific language.</i>	Explain degree of trust in results. Identify and <i>evaluate</i> scientific evidence (<i>their own and others?</i>) that has been used to support or refute ideas or arguments.
Y5 TAPS plans	Mat: dissolving Mat: nappy absorbency Forces: paper planes	Materials: insulation layers Zipline testing	Humans: growth survey Forces: spinners YS/6: Titanic pulleys	Materials: sugar cubes Space: craters Forces: Bottle flip	Materials: champion tapes Living things: life cycle research Solar system research	Forces: aquadynamics Forces: marble run YS/6: Bridge engineers
Y6 TAPS plans	Electricity: bulb brightness Light questions	Animals inc Humans: heart rate	Elect: conductive dough Terrific tasters	Living things: outdoor keys Light: investigating shadows	Living things invertebrate research	Evolution: fossil habitats Evolution: egg strength
Transition	Reaction catches	Yeast growth	Formula 1 tubs	Blood splatter	Lolly stick catapults	Cleaning coins









*Types of enquiry including: observing changes over time, noticing patterns, grouping and classifying, comparative and fair tests, using secondary sources.




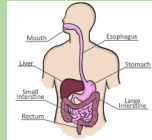



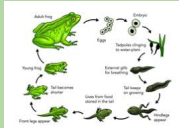



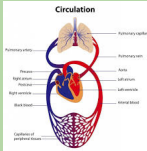

Progression statements are taken directly from England's 2014 National Curriculum, with small additions in *italics* from the 2018 Teacher Assessment Framework.

Biology
Physics
Chemistry

Chacewater School Science Theme Map

Science links to themes as well as being taught as stand alone units (as shown below)

	<u>Autumn Term</u>		<u>Spring Term</u>		<u>Summer Term</u>	
<u>EYFS</u>	<p>All About me!</p> <p>Staying healthy / Food / Human body How have I changed? My family.</p>			<p>Amazing Animals!</p> <p>Life cycles/Safari Animals around the world Hibernation Down on the Farm /Mini Beasts Animal Arts and crafts Night and day animals Animal patterns Happy Habitats Extinction – extinct animals. Life Cycle of butterflies Newts/ Tadpoles.</p>	<p>Come outside</p> <p>Plants - parts of a plant. How they grow. Seasonal changes</p>	<p>At the beach</p> <p>Materials</p>
<u>Year 1</u>	<p>Everyday Materials Who am I? The Big Build</p> 		<p>Animals, including humans Animal Allsorts</p> 	<p>Plants The Potting Shed</p> 		<p>Seasonal Changes To the rescue!</p> 
<u>Year 2</u>	<p>Animals, including humans What do I need to be me?</p> 		<p>Living things and their habitats Wild Cornwall</p> 	<p>Plants Sowing and Growing</p> 		<p>Everyday materials What's your Super power?</p> 

<u>Year 3</u>	<div>Animals, including humans</div> <div>Brilliant Bodies: What's inside us?</div> <div></div>		<div>Forces and Magnets</div> <div>Poles Apart</div>	<div>Rocks</div> <div>Rocks and Fossils</div> <div></div>	<div>Plants</div> <div>Fabulous Plants</div> <div></div>	<div>Light</div>
<u>Year 4</u>	<div>Animals, including humans</div> <div>Where does my food go?</div> <div></div>		<div>States of matter</div> <div>the water cycle (was Spring 2)</div> <div>Rivers</div> <div></div>	<div>Electricity</div> <div>& sound (Was Summer term 1)</div> <div>A world of Inventions</div> <div></div>	<div>Living things and their habitats (Was Summer 2)</div> <div>The Three Peaks & seven summits - Mountains</div> <div></div>	
<u>Year 5</u>	<div>Living things and their Habitats</div> <div>Animals, including Humans</div> <div>Life Cycles</div> <div></div>		<div>Properties and changes of materials</div> <div>Natural Disasters; Why is our Earth so volatile?</div> <div></div>	<div>Earth and Space</div> <div>Why leave Earth?</div> <div></div>	<div>Forces</div> <div>May the force be with you</div> <div></div>	
<u>Year 6</u>	<div>Animals, including Humans</div> <div>Have a Heart</div> <div></div>		<div>Evolution and Inheritance</div> <div>Living things and their Habitats</div> <div>Voyage of Discovery!</div> <div></div>		<div>Light</div> <div>Electricity</div> <div>Industrial Revolution and Victorians</div>	

Reception

EYFS Science Overview linked to Development Matters Statements revised framework 2021.

Progression of skills are: developed over the topics covered throughout the year (linked to the child's interests) and developed from the Autumn Term (with a focus on 3-4 statements), and the Spring Term (focus on reception aged statements) and the Summer Term (with a focus on ELG statements).

Children are constantly exposed to elements of all of these statements in continuous provision opportunities which are facilitated by the adults in the room, the opportunities exposed to children through their interests and the questions asked.

Autumn Theme: All about Me

**Spring Term Theme:
Superheroes
Amazing Animals**

**Summer Term Theme:
Come Outside**

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

All About Me

Coverage -

Children learnt about themselves. They look at themselves compared to others and start to identify simple parts of the human body - what makes me a me?

Hook books to support this learning

What makes me a me?
Elmer the Elephant
The Rainbow Fish

Amazing Animals

Coverage -

Children look closely at the lifecycle of animals. They do this by learning about animals in different countries, what they need to survive and how some animals are similar to us. Children learn about animals which are extinct and why this is. Children observe their very own class

Come Outside






Coverage -

Children learn about seasonal changes and what happens during these Seasons - what differences do we see and why? Children learn about plants by growing their own plants. They learn about what makes up a plant and watch the cycle of them growing.

<p style="text-align: center;"><u>Development Matters -</u></p> <p>Name and describe people who are familiar to them.</p> <p style="text-align: center;"><u>Examples of how we do this -</u></p> <p>Listen to what children say about their own experiences with people who are familiar to them.</p>	<p>animals change overtime by witnessing the life cycle of a caterpillar/butterfly and tadpole/frog.</p> <p style="text-align: center;"><u>Hook books to support this-</u></p> <p style="text-align: center;">Dear Zoo</p> <p style="text-align: center;">The Hungry Caterpillar</p> <p style="text-align: center;">The Tiger who went to tea</p> <p style="text-align: center;">Dangerous Dinosaurs</p> <p style="text-align: center;"><u>Development Matters -</u></p> <p>Understand the key features of the life cycle of a plant and an animal.</p> <p>Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Provide equipment to support these investigations. Suggestions: magnifying glasses or a tablet with a magnifying app.</p> <p style="text-align: center;"><u>Examples of how we do this-</u></p> <p>Help children to care for animals and take part in first-hand scientific explorations of an-imal life cycles, such as caterpillars.</p> <p>Plan and introduce new vocabulary related to the exploration. Encourage children to use it in their dis-cussions, as they care for living things.</p>	<p style="text-align: center;"><u>Hook books to support this-</u></p> <p style="text-align: center;">The Enormous Turnip</p> <p style="text-align: center;"><u>Development Matters -</u></p> <p>Plant seeds and care for growing plants. Understand the effect of changing seasons on the natural world around them.</p> <p style="text-align: center;"><u>Examples on how we do this-</u></p> <p>Encourage children to talk about what they see. Model observational and investigational skills. Ask out loud: "I wonder if...?"</p> <p>Plan and introduce new vocabulary, encouraging children to use it to discuss their findings and ideas.</p> <p>Show and explain the concepts of growth, change and decay with natural materials. Suggestions: Plant seeds and bulbs so children observe growth and decay over time. Observe an apple core going brown and mouldy over time. Guide children's understanding by draw children's attention to the weather and seasonal features.</p> <p style="text-align: center;"><u>At the beach</u></p> <p style="text-align: center;"><u>Coverage</u></p> <p>Children look at different modes of transport and life at a beach. They recap on their prior animal learning and experiment by creating their own boats - do they float? Do they not? Why not?</p>
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		<p><u>Hook Books to support this</u> Lighthouse keepers lunch Under the sea Chip</p> <p><u>Development Matters -</u> Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Explore and talk about different forces they can feel.</p> <p><u>Examples of how we do this-</u> Provide interesting natural environments for children to explore freely outdoors. Make collections of natural materials to investigate and talk about. How the water pushes up when they try to push a plastic boat under it How they can stretch elastic, snap a twig, but cannot bend a metal rod magnetic attraction and repulsion</p>
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Year 1

<p><u>Y1 THEME</u></p>	<p><u>Autumn term 1</u> The Big Build Everyday Materials</p> 	<p><u>Spring term 1</u> Animal Allsorts Animals, including humans</p>  <p><u>Spring term 2</u> The Potting Shed Plants</p> 	<p><u>Summer Term2</u> Pirates (seaside) /To the rescue Seasonal Changes</p>  
<p><u>Y1</u> <u>National Curriculum Programme of Study</u></p>	<p>Everyday Materials EM1 distinguish between an object and the material from which it is made EM2 identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock EM3 describe the simple physical properties of a variety of everyday materials EM4 compare and group together a variety of everyday materials on the basis of their simple physical properties</p>	<p>Animals, including Humans AH1 identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals AH2 identify and name a variety of common animals that are carnivores, herbivores and omnivores AH3 describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) AH4 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>Seasonal Changes SC1 observe changes across the four seasons SC2 observe and describe weather associated with the seasons and how day length varies.</p>

		<p>Plants</p> <p>P1 identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>P2 identify and describe the basic structure of a variety of common flowering plants, including trees.</p>	
<p><u>Y1</u></p> <p><u>Substantive Knowledge</u></p> <p><u>and</u></p> <p><u>SPECIFICS</u></p>	<p>Everyday Materials</p> <p><i>There are many different materials that have different describable and measurable properties.</i></p> <p><i>Materials that have similar properties are grouped into metal, water, rock, wood, plastic and glass.</i></p> <p><i>The properties of a material determine whether they are suitable for a purpose.</i></p> <p>Wood Properties: strong, flexible, long lasting, hard</p> <p>Metal Properties: strong, hard, shiny, smooth</p> <p>Plastic Properties: smooth, flexible, strong, waterproof</p> <p>Glass Properties - waterproof, see through, hard, smooth, strong but can shatter</p>	<p>Animals, including Humans</p> <p>Parts of human body: eyes, ears, nose, foot, thumb, toes, teeth, elbow, hand, fingers, shoulder, mouth, tongue, neck, head</p> <p><i>Senses - we have them to survive - and then respond</i></p> <p>eyes : sight</p> <p>ears: hearing</p> <p>tongue : taste</p> <p>skin : touch</p> <p>nose: smell (comparative & pattern seeking test)</p> <p>Carnivores (meat eating) : cats, polar bears, sharks</p> <p>Herbivores (plant eating) : horses, elephants, giraffes</p>	<p>Seasonal Changes</p> <p><i>There are 4 seasons</i></p> <p>Winter: Shorter and colder days Cold & icy</p> <p>Spring: Flowers start to grow</p> <p>Summer: Days are longer and hotter</p> <p>Autumn: Leaves fall from deciduous trees</p> <p><i>Weather can change</i></p> <p><i>Different types of weather: rain, sun, wind, snow, cloudy, fog, mist, thunderstorm</i></p>

	<p><i>Rock Properties - some hard (granite), some soft (chalk).</i></p> <p><i>Water Properties: Natural, clear, takes many shapes. Frozen = ice, heated = gas</i></p> <p>link to Big Build 'making shelters'</p>	<p><i>Omnivores (eats both plants and animals): humans, foxes, dogs</i></p> <p><i>Fish: cod, tuna, goldfish</i></p> <p><i>Mammals: humans, dolphins, dogs, hamsters,</i> <i>Reptiles: snakes, lizard, gecko,</i></p> <p><i>Amphibians: frogs, toads, slowworms</i></p> <p><i>Birds: blackbird, sparrow, vulture</i></p> <p><i>Animals need food to: survive, grow, repair their bodies, be active, stay healthy.</i></p> <p><u>animals:</u> fox, owl, mouse, snake, dog, penguin</p> <p>Plants</p> <p><i>Deciduous trees lose their leaves in the winter (identify oak, beech, birch, horse chestnut)</i></p> <p><i>Evergreen trees keep their leaves all year round (identify holly, yew, fir - sorting leaves investigation)</i></p> <p><i>We eat different parts of different plants. (roots, fruit, seeds, stem) (observe and grow vegetables and flowers in the garden)</i></p> <p><i>leaf fruit seed branch trunk root</i></p> <p><i>flower (petal) Leaf seed stem root bulb</i></p> <p><u>wild plants:</u> buttercup, daisy, dandelion, clover, brambles. <u>garden plants:</u> lavender, daffodil, sunflower. rhododendron - link to George Forrest</p>	
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		<u>trees</u> : horse chestnut, oak, fir, pine <u>vegetables</u> - rhubarb, carrots, other vegetables growing in the school garden	
<p><u>Y1</u> <u>Vocabulary</u></p> <p>Yellow - words <u>most</u> children will already know</p> <p>Green - new vocabulary to teach and assess against</p> <p>Blue - aspirational vocabulary</p>	<p>Everyday Materials</p> <p>Wood, Plastic, Glass, Paper, Water, Metal, Rock, brick, fabric. Hard, Soft, Bendy, Rough, Smooth, stretchy, waterproof,</p> <p>absorbent, opaque, transparent, solid, flexible</p>	<p>Animals, including humans</p> <p>animal, bird, fish, insect, pet, head, arm, leg, foot, face, teeth, shoulders, ear, eye, nose, hand</p> <p>Fish (scales, fins, gills), Reptiles (scales, leg eggs) , Mammals (breath air, fur, hair, live young, produce milk) , Birds (wings, beak, feathers, eggs) , Amphibians (born in water, smooth slimy skin)</p> <p>Herbivore, Omnivore, Carnivore, sight, hearing, touch, taste, smell</p> <p>warm blooded, cold-blooded</p> <p>Plants</p> <p>tree, flower, leaf, garden,</p> <p>Deciduous Evergreen trees, Leaves, Flowers, Petals, Fruit, Roots, Seed, Trunk, Branches, Stem, wild plant, garden plant, weed</p> <p>bulb, blossom</p>	<p>Seasonal Changes</p> <p>Summer, Spring, Autumn, Winter, weather, sun, moon, day, night, light/dark</p> <p>Daylight, season, rain, snow, ice, storm, thunder, lightening, cloudy, clothing, warm, cold, forecast</p> <p>rainfall, precipitation, data, wind direction, gauge, patterns</p>

**Y1 ENQUIRY
SKILLS**

Identifying, Classifying
and Grouping



We need to choose a material to make a wolf-proof window. Which materials are transparent & waterproof? (**plan an enquiry**)

How can we group these materials according to their properties? (**present results**)

Observing Over Time



What happens to ice left on the windowsill? (**observe closely**)

Comparative and
Fair Testing



Which materials are the most flexible? (**interpret results**)

Identifying, Classifying
and Grouping



How can we organise animals? (e.g. omnivores/ carnivores/ herbivores) (**to observe closely**)

What are the names for all the parts of our bodies? (**to observe closely**)

How can we **sort** the leaves that we collected on our walk? (**observe closely**)

Comparative and
Fair Testing



Which tree has the biggest leaves? (**taking measurements**)

Pattern Seeking



Is there a pattern in where we find moss growing in the school grounds? (**to ask scientific questions**)

Identifying, Classifying
and Grouping




How do you know what season this is? (**observe closely**)


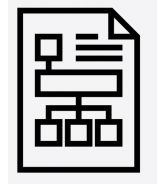


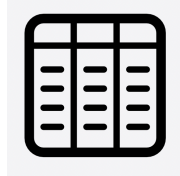


Pattern Seeking



In which season does it rain the most? (**interpret results**)

		<div> <div>Research Using Secondary Resources</div> <div>  </div> </div> <p>What are the most common British plants and where can we find them?</p>	
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Y1 Working Scientifically (Disciplinary Knowledge)

PLAN		DO			REVIEW	
Ask scientific questions	Plan an enquiry	Observe closely	Take measurements	Gather/record results	Present results	Interpret results
						

Y1 Progression of Skills

asking simple questions and recognising that they can be answered in different ways

observing closely, using simple equipment and measurement

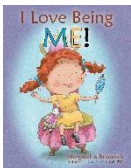



performing simple tests

identifying and classifying

using their observations and ideas to suggest answers to questions

gathering, recording and communicating data and findings to help in answering questions.

Year 2

<p><u>Y2 THEME</u></p>	<p><u>Autumn term 1</u> What do I need to be me? Animals including humans</p> 	<p><u>Spring Term 1</u> Wild Cornwall Living things and their habitats</p>  <p><u>Spring Term 2</u> Sowing and Growing Plants</p> 	<p><u>Summer Term 2</u> What's your Super power? Uses of everyday materials</p> 
<p><u>Y2 National Curriculum Programme of Study</u></p>	<p><u>Animals including Humans</u> AH1 notice that animals, including humans, have offspring which grow into adults AH2 find out about and describe the basic needs of animals, including humans, for survival (water, food and air) AH3 describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p><u>Living Things and their Habitats</u> LH1 explore and compare the differences between things that are living, dead, and things that have never been alive LH2 identify that most living things live in habitats to which they are suited LH3 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><u>Uses of Everyday Materials</u> EM1 identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses EM2 find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>

		<p>LH4 identify and name a variety of plants and animals in their habitats, including micro-habitats</p> <p>LH5 describe how animals obtain their food from plants and other animals</p> <p>LH6 understand a simple food chain, and identify and name different sources of food.</p> <p>Plants</p> <p>P1 observe and describe how seeds and bulbs grow into mature plants</p> <p>P2 find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	
<p><u>Y2</u></p> <p><u>Substantive Knowledge</u></p> <p><u>and</u></p> <p><u>SPECIFICS</u></p>	<p><u>Animals including Humans</u></p> <p><i>Basic needs of animals for survival: water, food (nutrition), air</i></p> <p><i>Importance for humans of: exercise, diet (comparison over time investigation), hygiene</i></p> <p><i>Life cycle for animals</i></p> <p><i>Baby, toddler, child, teenager, adult</i></p> <p><i>Once they are adults, they do not get bigger</i></p> <p><i>Animals reproduce (have babies - offspring)</i></p> <p><i>Animals will die at some point in their life</i></p>	<p><u>Living Things and their Habitats</u></p> <p><i>Some things are living, some were once living but are now dead and some things never lived.</i></p> <p><i>All living things have characteristics that are essential for keeping them alive (- moving, growing, link to senses (y1), getting rid of waste, having babies, breathing, taking in food and water)</i></p> <p><i>Animals obtain their food from plants and other animals.</i></p> <p><i>Herbivores eat plants, carnivores eat other animals, omnivores eat plants and animals.</i></p>	<p><u>Uses of Everyday Materials</u></p> <p><i>Materials can be changed by force - twisting, bending, squashing and stretching</i></p> <p>Wood Uses: building materials, tables, chairs, doors, beds, cupboards, picture frame</p> <p>Metal Properties: malleable, some are magnetic, some allow electricity to pass through. Uses: knives, forks, shovels, pipes</p> <p>Glass Uses: windows, mirrors, glasses</p> <p>Rock Uses: building material, cooking</p> <p>Plastic Properties: can be made into any shape, not magnetic, can be coloured, transparent,</p>

	<p>Animals move in order to survive</p> <p>Animals move by the muscles and bones working together</p> <p>Exercise keeps animal's bodies in good condition and increases survival chance</p> <p>Life cycle (Identify & classify - which offspring belong to which animal?)</p> <p>egg, chick, chicken egg, caterpillar, pupa, butterfly spawn, tadpole, frog, lamb, sheep.</p> <p>Life cycle of humans Life cycle of a chicken</p>	<p>A predator is a carnivorous animal and the animal they eat is their prey. (simple food chains)</p> <p>Animals and plants depend on each other to survive. (plants are a source of food and shelter for animals) .</p> <p>Different animals and plants live in different places.</p> <p>A habitat is a natural environment or home of a variety of plants and animals. (focus on ocean, coastal and woodland habitats)</p> <p>Different habitats provide for the basic needs of different kinds of animals and plants.</p> <p>Living things are adapted to survive in different habitats.</p> <p>A micro-habitat is a very small habitat. (focus on minibeast and pond life)</p> <p>Ocean habitat Coastal habitat Woodland habitat Micro habitat Basic food chains (3 stages)</p> <p>Plants</p> <p>Plants grow from bulbs or seeds</p> <p>They have a store of food so do not need light to grow.</p>	<p>translucent or opaque. Uses: bank cards, watering cans, toys, bottles</p> <p>Rubber Properties: strong, elastic, flexible</p> <p>Uses: car tyres, hoses, belts, matting, medical gloves</p> <p>Paper Properties: flexible, lightweight. Uses: newspaper, wrapping paper, envelopes, magazines, cartons</p> <p>Fabric Properties - warm, absorbent, soft, flexible, some fabrics are natural - cotton is cool and absorbent, wool gives warmth, some are man-made - easy to wash and dry and hard-wearing. Uses: clothes, cloths, scarfs, gloves</p> <p>Pottery Properties - strong but glaze pottery can shatter, usually opaque. Uses: crockery, tiles</p> <p>Cardboard Properties: strong, light, stiff Uses: boxes, cereal boxes, paper towels, chipboard</p>
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		<p><i>Germination: Warmth, water NO LIGHT (underground)</i></p> <p><i>Plants need light, water and warmth to grow and stay healthy.</i></p> <p><i>Flowers make seeds to make more plants (reproduce)</i></p> <p>Broad bean plant Daffodil bulb Oak Tree Plant conditions experiment - no light but water, water but no light, both and neither for bulbs and seeds</p>	
<p><u>Y2</u> <u>Vocabulary</u></p> <p>Yellow - words <u>most</u> children will already know</p> <p>Green - new vocabulary to teach and assess against</p> <p>Blue - aspirational vocabulary</p>	<p>Animals including humans</p> <p>Adult, Baby, Water, Air, Food, Growth, Exercise, Kitten, Calf, Puppy, meat, vegetables, Young, toddler, child, teenager</p> <p>Offspring, Hygiene, Survival, balanced diet, elderly, heart rate, healthy, unhealthy</p> <p>nutrients, vitamins, reproduce, nutrition</p>	<p>Living things and their habitats</p> <p>living, dead, pond, insect, carnivore, omnivore, basic needs, herbivore,</p> <p>habitat, energy, food chain, predator, prey, woodland, desert, micro, life processes, coastal, alive</p> <p>producer, consumer, adaptation, sources</p> <p>Plants</p> <p>Growth, Water, Light, Seeds, soil, roots, sunlight, leaf, flower, stem, tree</p> <p>temperature, bulbs, seedling, shoot, wither, suitable, bud, condition</p> <p>nutrients, seed dispersal</p>	<p>Uses of everyday materials</p> <p>hard, Soft, rough, smooth, waterproof, shiny, wood, plastic, glass, brick, rock, paper, cardboard, foil, material, object</p> <p>squashing, twisting stretching, stiff, bending, shiny, dull, metal, elastic, suitability, see through, properties</p> <p>absorbent, opaque, transparent, translucent, reflective</p>

Y2 ENQUIRY SKILLS

Research Using Secondary Resources



What food do you need in a healthy diet and why? What do you need to do to look after a pet dog/cat/lizard and keep it healthy?

Identifying, Classifying and Grouping



Which offspring belongs to which animal?
(observe closely)

Observing Over Time



How much food and drink do I have over a week?
(gather and record results)

Identifying, Classifying and Grouping



What are the similarities and differences between bulbs and seeds? (observe closely and ask scientific questions)

Can you group things to show which are living, dead, or have never been alive? (observe closely)

Observing Over Time



What happens to my bean after I have planted it? Germination (observing closely)

Comparative and Fair Testing



Do cress seeds grow quicker inside or outside?
(plan an enquiry)

Comparative and Fair Testing




Which material would be best for? (plan an enquiry)


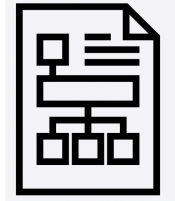


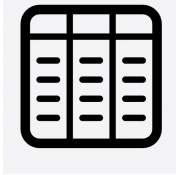


Identifying, Classifying and Grouping



Can you group these items according to their properties and uses? - float/sink, let electricity go through them/not shiny/dull? (present and interpret results)

		<div> <div>Pattern Seeking</div>  </div> <p>Do bigger seeds grow into bigger plants? (interpret results)</p> <p>What conditions do woodlice prefer to live in? (present results)</p>	
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Y2 Working Scientifically (Disciplinary Knowledge)

PLAN		DO			REVIEW	
Ask scientific questions	Plan an enquiry	Observe closely	Take measurements	Gather/record results	Present results	Interpret results
						

Y2 Progression of Skills

asking simple questions and recognising that they can be answered in different ways

observing closely, using simple equipment and measurement




performing simple tests

identifying and classifying

using their observations and ideas to suggest answers to questions

gathering, recording and communicating data and findings to help in answering questions.

Year 3







<p><u>Y3 THEME</u></p>	<p><u>Autumn term 1</u> Brilliant Bodies:What's inside us? Animals, including humans</p> 	<p><u>Spring term 1</u> Forces and Magnets</p> <p><u>Spring term 2</u> Rocks and Fossils Rocks</p> 	<p><u>Summer term 1</u> Fabulous Plants Plants</p>  <p><u>Summer term 2</u> Light</p>
<p><u>Y3 National Curriculum Programme of Study</u></p>	<p><u>Animals including Humans</u></p> <p>AH1 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</p> <p>AH2 identify that humans and some animals have skeletons and muscles for support, protection and movement.</p>	<p><u>Forces and Magnets</u></p> <p>FM1 compare how things move on different surfaces</p> <p>FM2 notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>FM3 observe how magnets attract or repel each other and attract some materials and not others</p> <p>FM4 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>FM5 describe magnets as having two poles</p>	<p><u>Plants</u></p> <p>P1 identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>P2 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</p> <p>P3 investigate the way in which water is transported within plants</p> <p>P4 explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>






		<p>FM6 predict whether two magnets will attract or repel each other, depending on which poles are facing</p> <p>Rocks</p> <p>R1 compare and group together different kinds of rocks (including those in the locality) on the basis of appearance and simple physical properties</p> <p>R2 describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>R3 recognise that soils are made from rocks and organic matter.</p>	<p>Light</p> <p>L1 recognise that they need light in order to see things and that dark is the absence of light</p> <p>L2 notice that light is reflected from surfaces</p> <p>L3 recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>L4 recognise that shadows are formed when the light from a light source is blocked by a solid object</p> <p>L5 find patterns in the way that the size of shadows change.</p>
<p><u>Y3</u></p> <p><u>Substantive Knowledge</u></p> <p><u>and</u></p> <p><u>SPECIFICS</u></p>	<p>Animals, including humans</p> <p><i>The Skeleton:</i></p> <p><i>Supports Holds upright</i></p> <p><i>Protects vital organs Skull: brain, Ribs: lungs Pelvis: reproductive organs</i></p> <p><i>Movement: Connected to bones and move the when they contract (contract and relax) Movable joints connect bones (comparative investigation)</i></p>	<p>Forces and Magnets</p> <p><i>Objects move differently on different surfaces.</i></p> <p><i>Some forces need contact between 2 objects, but magnetic forces can act at</i></p> <p><i>Magnets exert non-contact forces, which work through some materials and can act at a distance.</i></p> <p><i>Magnet forces are affected by magnet strength, object mass, distance from object and object material.</i></p>	<p>Plants</p> <p><i>Different plants need different amounts of air, light, water, nutrients from the soil and room to grow. (orchids don't need soil)</i></p> <p><i>Seed dispersal: Water (coconuts) Wind (sycamore) Animals in droppings (fruit) Animals on fur (barbed seed)</i></p> <p><i>Every part of a flowering plant has a function: Flower: has petals to attract insects for reproduction</i></p>

	<p>Exoskeleton - skeletons outside the body Endoskeletons - skeletons inside the body</p> <p>(Identify and classify: looking at different skeletons)</p> <p>Vertebrate - animals with a backbone Invertebrate - animals without a backbone</p> <p>Animals need the right types and amount of nutrition (carbohydrates, proteins, fats, vitamins, minerals, water fibre)</p> <p>Animals cannot make their own food</p> <p>Animals get their nutrition from what they eat. A nutritious balanced diet is important</p> <p>Different animals are adapted to eat different foods.</p> <p>Nutrients, water and oxygen are transported within animals and humans.</p> <p>Human, mouse, tarantula, crab, jellyfish.</p>	<p>We use different types of magnets for different functions in our everyday life.</p> <p>Magnets exert attractive forces on some materials. Magnetic materials are always made of metal, but not all metals are magnetic. Iron is magnetic, steel is magnetic because it has iron in it.</p> <p>Magnets have 2 poles - north pole and south pole.</p> <p>Magnets exert attractive and repulsive forces on each other.</p> <p>Like poles repel each other (N-N or S-S) and opposites attract (N+S or S+N)</p> <p>Rocks</p> <p>There are different types of rock with different properties - (build on year 1 and 2 knowledge)</p> <p>Some are permeable (sandstone) and allow water to pass through. Some are impermeable (slate) so water cannot pass through them. Some hard (granite), some softer (chalk).</p> <p>Some rocks come from volcanoes, some build up with layers and have fossils in them and some change from one type to another. They may have grains or crystals.</p> <p>Fossils are formed when things that have lived are trapped within layers of sediment over a long period of time and under extreme pressure.</p>	<p>Leaves: absorb sunlight and carbon dioxide (photosynthesis to make their own food - they are PRODUCERS)</p> <p>Stem/trunk: - transports water and supports the leaves (celery investigation and /or carnation investigation)</p> <p>Roots: act as an anchor and draws water from the soil</p> <p>Pollination: The act of transferring pollen grains from the male anther of a flower to the female stigma. This is producing offspring for the next generation. (4 stages)</p> <ul style="list-style-type: none"> - Insects attracted by bright colours and sweet nectar - Pollen stays onto the insect - Insect flies to another plant attracted by the bright colours and sweet nectar and the pollen rubs off - Fertilisation happens - Seeds are produced <p>Stamen is the male part; Stigma is the female part</p> <p>Life Cycle of a Dandelion Radish - fast germinator edible root Primrose - seed Hyacinth - Bulb</p>
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		<p><i>They are then found within the rock that is formed.</i></p> <p><i>Fossils tell us what has happened before.</i></p> <p><i>Fossils provide evidence that living things have changed over time.</i></p> <p><i>Rocks break down over time to become part of the soil mixture.</i></p> <p><i>Soil is made from rocks and organic matter.</i></p> <p><i>Half of soil is air and water. In soil you can find sand, small stones, bits of leaves and roots. There are also millions of microorganisms in the soil which help break down the matter and make the soil healthy and full of life.</i></p>	<p>Apple Tree - life cycle</p> <p>Light</p> <p><i>Light is a form of energy which makes it possible to see and it comes from a source. A light source can be natural (such as the sun) or man-made (such as a torch or light bulb).</i></p> <p><i>There must be light for us to see. Without light it is dark. Dark is the absence of light. Objects are easier to see if there is more light.</i></p> <p><i>Light is reflected from surfaces. We need light to see things even shiny things. Shiny materials reflect light beams better than non-shiny materials.</i></p> <p><i>When light hits an object, it can be absorbed by the object, reflect (bounce off) the object, or (transmit) pass through an object. The three key terms below tell us how much light objects let through them.</i></p> <p>Transparent – Transparent objects allow all of the light to pass through them. This means that we can clearly see through them. Translucent – Translucent objects only allow some light to pass through them. This means that we can partially see through them. Opaque – Opaque objects do not allow any light to pass through them. This means cannot see through them at all.</p> <p><i>Some types of light (e.g. light from the sun) can be dangerous for our eyes and skin. This is</i></p>
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			<p><i>because they contain UV rays that can cause damage. There are several things that we can do to protect ourselves in the sun</i></p> <p><i>1. Wearing sunglasses – Sunglasses reduce the amount of light (and also the UV rays) that reaches our eyes.</i></p> <p><i>2. Covering up – Clothes can help to block some of the UV rays that can damage our skin.</i></p> <p><i>3. Sun cream – This stops our skin from absorbing as many UV rays, protecting it from harm.</i></p> <p><i>You should NEVER look directly at the sun.</i></p> <p><i>Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface, blocking some of the light.</i></p> <p><i>The size of the shadow depends on the position of the source, the object and the surface. When the light source hits the object at an angle, the shadow will be longer.</i></p>
<p><u>Y3 Vocabulary</u></p> <p>Yellow - words <u>most</u> children will already know</p> <p>Green - new vocabulary to</p>	<p><u>Animals, including humans</u></p> <p>Movement, muscles, bones, water.</p> <p>Skull, nutrition, skeletons, vertebrate, invertebrate, vitamins, minerals, fat, protein, carbohydrates, fibre, ribs, spine, organs, joints, muscles, contract, relax.</p> <p>Muscular-skeletal system.</p>	<p><u>Forces and Magnets</u></p> <p>Push, Pull, group, materials, facing.</p> <p>Force, contact, move magnetic, attract, repel, friction, poles, magnet.</p> <p>Bar magnet, ring magnet, button magnet, horse-shoe magnet, constant force, Newton meter.</p>	<p><u>Plants</u></p> <p>Air, light, water, roots, stem/trunk, leaves and flowers, soil, seed, bulb.</p> <p>Reproduction, function, transportation, dispersal, pollination, nutrients, investigation, petal, pollen.</p>

<p>teach and assess against</p> <p>Blue - aspirational vocabulary</p>		<p>Rocks</p> <p>Brick, rock, soil, change.</p> <p>Organic matter, top soil sub soil, bedrock, igneous, magma, pressure, layers, hardens, fossils, sedimentary, igneous, metamorphic.</p> <p>Solidifies, minerals, compressed, chemically, crystals, grains, erosion, deposited.</p>	<p>Stigma, style, ovary, ovule, anther, filament, sepal</p> <p>Light</p> <p>Light, shadows, mirror, dark, change, pattern, sun.</p> <p>Reflective, reflection, absence, surfaces, protection, solid, light sources.</p> <p>Spectrum, refraction.</p>
<p><u>Y3 ENQUIRY SKILLS</u></p>	<div data-bbox="539 703 795 858"> <p>Comparative and Fair Testing</p>  </div> <p>Do you jump further with longer legs? (plan an enquiry/gather,record and interpret results)</p> <div data-bbox="539 1002 795 1157"> <p>Research Using Secondary Resources</p>  </div> <p>What animals have a hydrostatic skeleton and what is it?</p>	<div data-bbox="1088 603 1346 758"> <p>Pattern Seeking</p>  </div> <p>Do magnetic materials always conduct electricity? (plan an enquiry)</p> <p>How does a coin move across a variety of surfaces (gather and record results)</p> <div data-bbox="1088 1038 1346 1193"> <p>Observing Over Time</p>  </div> <p>If we magnetise a pin, how long does it stay magnetised for? (evaluate enquiry)</p>	<div data-bbox="1641 595 1899 746"> <p>Identifying, Classifying and Grouping</p>  </div> <p>How many different ways can you group our seed collection? (observe closely)</p> <p>How are seeds dispersed? (present results)</p> <p>Can you identify light sources and reflectors? (draw conclusions)</p> <div data-bbox="1641 1114 1899 1265"> <p>Comparative and Fair Testing</p>  </div> <p>Do plants need soil to grow? (plan an enquiry)</p>

	<div>Identifying, Classifying and Grouping</div>  <p>How do the skeletons of different animals compare? (to be able to ask scientific questions)</p>	<div>Identifying, Classifying and Grouping</div>  <p>Can rocks be grouped according to their properties? - check names using identification key (observe closely)</p> <div>Comparative and Fair Testing</div>  <p>Which magnet is strongest? (make a prediction)</p> <p>How does adding different amounts of sand to soil affect how quickly water drains through it? (gather/record results) (to interpret results and draw conclusions)</p>	<div>Observing Over Time</div>  <p>What happens to celery when it is left in a glass of coloured water? (observe closely) (interpret results and draw conclusions)</p> <p>How does my shadow change over the day? (gather and record results)</p> <div>Pattern Seeking</div>  <p>Can you find patterns in the way that the sizes of shadows change? (make a prediction)</p>
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Y3 Working Scientifically (Disciplinary Knowledge)

PLAN			DO			REVIEW		
Ask scientific questions	Plan an enquiry	Make a prediction	Observe closely	Take measurements	Gather/record results	Present results	Interpret results/draw conclusions	Evaluate an enquiry
???								

Y3 Progression of Skills

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

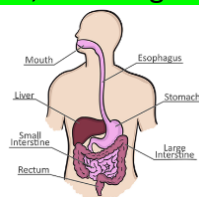
Year 4

Y4 THEME

Autumn term 1

Where does my food go?

Animals, including humans



Spring term 1

Raging Rivers and Cornish Coasts

States of matter
the water cycle



Spring term 2

A world of Inventions

Electricity & sound



Summer term 1

Mountains- The Three Peaks

Living things and their habitats



Y4 National Curriculum Programme of Study

Animals including Humans

AH1 describe the simple functions of the basic parts of the digestive system in humans

AH2 identify the different types of teeth in humans and their simple functions

States of Matter

SM1 compare and group materials together, according to whether they are solids, liquids or gases

SM2 observe that some materials change state when they are heated or cooled, and measure or research the

Living things and their Habitats

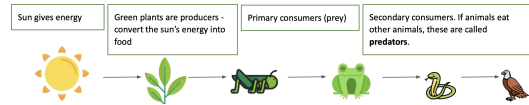
LH1 recognise that living things (including those in the locality) can be grouped in a variety of ways

LH2 explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

	<p>AH3 construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>temperature at which this happens in degrees Celsius (°C)</p> <p>SM3 identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>Electricity</p> <p>E1 identify common appliances that run on electricity</p> <p>E2 construct a simple series circuit, identifying/naming its basic parts, including cell, wire, bulb, switch and buzzer</p> <p>E3 identify whether or not a lamp will light in a simple series circuit/</p> <p>E4 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>E5 recognise some common conductors and insulators, and associate metals with being good conductors</p> <p>Sound</p> <p>S1 identify how sounds are made, associating some of them with something vibrating</p> <p>S2 recognise that vibrations from sounds travel through a medium to the ear</p>	<p>LH3 recognise that environments can change and that this can sometimes pose dangers to living things.</p>
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		<p>S3 find patterns between the pitch of a sound and features of the object that produced it</p> <p>S4 find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>S5 recognise that sounds get fainter as the distance from the sound source increases.</p>	
<p><u>Y4</u></p> <p><u>Substantive Knowledge</u></p> <p><u>and</u></p> <p><u>SPECIFICS</u></p>	<p>Animals including Humans</p> <p><i>Teeth & functions (Identify & Classify)</i></p> <p><i>Incisor: found at the front, humans have 8, flat side for cutting</i></p> <p><i>Canines: sharp pointed teeth used for earring. Humans have 4</i></p> <p><i>Premolar : humans have 8</i></p> <p><i>Molar: rounded with a flat surface, used for grinding food into smaller parts. Humans have 12</i></p> <p><i>Caring for teeth: ● Regular dentist ● Cleaning regularly ● Diet (observation over time investigation)</i></p> <p>Digestive system</p> <p><i>Organs that break down food so that it can be absorbed by the body. It also gets rid of waste</i></p>	<p>States of Matter</p> <p><i>Materials can be divided into solids (flour, ice, wood), liquids (honey, water, milk) and gases. (steam, oxygen, carbon dioxide, helium)</i></p> <p><i>Solids, liquids and gases are described by observable properties.</i></p> <p>Solids: <i>stay in one place and can be held/ keep their shape. They do not flow like liquids/always take up the same amount of space. They do not spread out like gases/ can be cut or shaped.</i></p> <p><i>Even though they can be poured, sugar, salt and flour are all solids. Each particle of salt, for example, keeps the same shape and volume.</i></p> <p>Liquids: <i>can flow or be poured easily. They are not easy to hold/change their shape depending on the container they are in/Even when liquids change their shape, they always take up the same amount of space. Their volume stays the same.</i></p>	<p>Living things and their Habitats</p> <p><i>Living things can be grouped in different ways. (wide selection including animals, flowering plants and non-flowering plants - pond dipping, ocean)</i></p> <p><i>Vertebrates (backbone)</i></p> <p>Classification</p> <p>Mammals: <i>live young, hair/fur, lungs , provide milk for young, warm blooded</i></p> <p>Birds: <i>lay eggs with hard shells, feathers, lungs, warm blooded</i></p> <p>Fish: <i>lay eggs, scales, gills, cold blooded</i></p> <p>Amphibians: <i>smooth or bumpy, moist skin, Lay eggs with soft shells, cold blooded,</i></p>

	<p>from the body.</p> <p>Teeth: cut and chew food and saliva is added.</p> <p>The food is soft and easier to swallow.</p> <p>The tongue moves food around the mouth</p> <p>Oesophagus : transport food from the mouth to the stomach</p> <p>Stomach : contains enzymes to help break down food and kill any microorganisms that may have been swallowed with the food</p> <p>Small intestines: Digested food is absorbed through the walls of the small intestine. The blood then carries the nutrients around the body. The wall of the small intestine is covered in villi, which helps the efficiency of transference of nutrients.</p> <p>Large intestines: Now that all the goodness has been absorbed, waste is left which cannot be absorbed or the body doesn't need. This is called faeces. It comes out of the body via the rectum.</p> <p>Gallbladder: stores bile, which is made in the liver. This breaks down fatty food.</p> <p>Food chains - energy is transferred from the sun to animals through consumption</p>	<p>Gases: are often invisible/ do not have a fixed shape. They spread out and change their shape and volume to fill up whatever container they are in/ can be squashed.</p> <p>Heating causes solids to melt into liquids and liquids evaporate into gases.</p> <p>Cooling causes gases to condense into liquids and liquids to freeze into solids. The temperature at which given substances change state are always the same.</p> <p>The water cycle is the continuous journey of water from the land to the sky and back to the land again. This constant movement of water is happening all the time and is vital to supporting life on earth.</p> <p>There are three main stages in the water cycle:</p> <p>Evaporation happens when warmth from the sun causes water (liquid) from the sea, lakes and rivers to rise into the air and turn to vapour (gas). Condensation happens when the water vapour cools and turns back into drops of water which form clouds in the sky. Precipitation is when the clouds get too heavy and water falls from the clouds in the form of rain, snow, sleet or hail.</p> <p>Electricity</p> <p>A source of electricity (mains or battery) is needed for electrical devices to work. Kettle, lamp, television etc uses the mains electricity. A mobile phone, tablet, torch uses batteries.</p>	<p>Reptiles: scales, usually lay eggs (Leathery shells), cold blooded(classification keys investigation)</p> <p>Environmental change affects different habitats differently.</p> <p>Different organisms are affected differently by environmental change.</p> <p>Habitats change throughout the year.</p> <p>Human activity significantly affects the environment both positively and negatively.</p>
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4 or 5 stage food chain

Electricity sources push electricity round a circuit.

Electricity (mains) can be dangerous and it is important to know how to work with electricity safely.

A complete circuit is needed for electricity to flow and devices to work.

A complete circuit is a loop that allows electrical current to flow through wires.

A circuit contains a battery (cell), wires and an appliance that requires electricity to work (such as a bulb, motor or buzzer).

The electrical current flows through the wires from the battery (cell) to the bulb, motor or buzzer).

A switch can break or reconnect a circuit.

A switch controls the flow of the electrical current around the circuit. When the switch is off, the current cannot flow. This is not the same as an incomplete circuit.

Some materials allow electricity to flow easily and these are called conductors. Materials that don't allow electricity to flow easily are called insulators.

Many metals, such as copper, iron and steel, are good conductors of electricity. Plastic, wood, glass and rubber are examples of good electrical insulators.

		<p>Sound</p> <p><i>Sound is created when something vibrates and sends waves of energy (vibration) into our ears. The vibrations travel through the air or another medium (solid, liquid or gas) to the ear.</i></p> <p><i>Sound moves through all materials by making them vibrate.</i></p> <p><i>The stronger the vibrations, the louder the sound.</i></p> <p><i>Sounds are fainter the further you get from the sound source. Sound spreads out as it travels. Bigger vibrations produce louder sounds and smaller vibrations produce quieter sound</i></p> <p><i>Pitch is the quality of a sound (high or low) and depends on the speed of the vibrations.</i></p> <p><i>Different materials produce different pitches; if an object vibrates quickly we hear a high-pitched sound, and if an object vibrates slowly we hear a low-pitched sound</i></p> <p><i>Faster vibrations (higher frequencies) produce higher pitched sounds</i></p> <p><i>Changing the shape, size and material of an object will change the sound it produces</i></p> <p><i>Sound travel can be blocked. (sound muffling investigation)</i></p>	
<p>Y4 Vocabulary</p>	<p>Animals, including humans</p>	<p>States of matter</p>	

<p>Yellow - words <u>most</u> children will already know</p> <p>Green - new vocabulary to teach and assess against</p> <p>Blue - aspirational vocabulary</p>	<p>Mouth, Tongue, Teeth, Stomach, Predator, Prey Oesophagus, Small Intestine, Large Intestine, anus, rectum, saliva, Herbivore, Carnivore, Canine, Incisor, Molar, Producers, Consumer, decay,</p> <p>Salivary glands, Chemical enzymes, Gastric (stomach) acid, enamel,</p>	<p>Temperature, Freezing, Heating, melting, cooling</p> <p>Solid, Liquid, Gas, Evaporation, Condensation, Particles, Water vapour, Water cycle, Precipitation, container, changing state, thermometer, Boiling point</p> <p>Solidify, Transpiration</p> <p>Sound</p> <p>Volume, Speaker, sound, travel</p> <p>Vibration, sound wave, Pitch, Tone, sound source, vibrate, echo, tune</p> <p>Insulation, strength of vibration, reflection of sound</p> <p>Electricity</p> <p>Electricity, Battery, Bulb, lamp</p> <p>Cells, Wires, Switches, Buzzers, Circuit, Series, Conductors, Insulator, series circuit, open and closed circuit, positive, negative</p> <p>Voltage, volt</p>	<p>Living things and their habitats</p> <p>Fish, birds, snails, slugs, worms, spiders, insects, flowering, non-flowering</p> <p>environment, Amphibians, Reptiles, Mammals, Habitats, microorganisms, Vertebrates, Invertebrates, adaptation and sources, classification, classification keys</p> <p>ecologically, nature reserves</p>
<p><u>Y4 ENQUIRY SKILLS</u></p>	<p>Observing Over Time</p> 	<p>Comparative and Fair Testing</p>  <p>Does sea-water evaporate faster than fresh-water? (to make a prediction)</p>	<p>Research Using Secondary Resources</p>  <p>How do nature reserves positively affect the environment?</p>

How does an egg shell **change** when it is left in cola/different drinks/liquids? (to observe closely)

Pattern Seeking



Are foods that are high in energy always high in sugar? (interpret results and draw conclusions)

Identifying, Classifying and Grouping



Can you identify the names for all the organs involved in the digestive system? (to observe closely)

Which material is best to use for **muffling sound** in ear defenders? (plan an enquiry)

How does the volume of a drum change as you move further away from it? (to gather/record results)

Which metal is the best conductor of electricity? (plan an enquiry)

Identifying, Classifying and Grouping



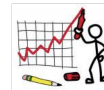
Can you group these materials and objects into solids, liquids, and gases? (to ask scientific questions)

Observing Over Time



How does the level of water in a glass change when left on the windowsill? (to gather/record results) (to interpret results)

Pattern Seeking

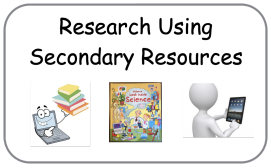


Can we use classification keys to group the animals/plants we have found in our school outdoor environment? (observing closely)









Pattern Seeking



How has the use of insecticides affected the bee population? (interpret results/draw conclusions)

		<p>Which room has the most electrical sockets in a house? (to make a prediction)</p> <div> <p>Research Using Secondary Resources</p>  </div> <p>How has electricity changed the way we live?</p>	
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Y4 Working Scientifically (Disciplinary Knowledge)

PLAN			DO			REVIEW		
Ask scientific questions	Plan an enquiry	Make a prediction	Observe closely	Take measurements	Gather/record results	Present results	Interpret results/draw conclusions	Evaluate an enquiry
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Y 4 Progression of Skills

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

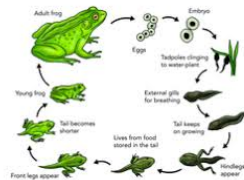
using straightforward scientific evidence to answer questions or to support their findings

Year 5

Y5 THEME

Autumn term

Life Cycles - The Circle of Life
 Living things and their Habitats
 Animals, including Humans



Spring term 1

Natural Disasters; Why is our Earth so volatile?

Properties and changes of materials



Spring term 2

Why leave Earth?

Earth and Space

Summer term 1

May the force be with you!

Forces



			
<p><u>Y5 National Curriculum Programme of Study</u></p>	<p><u>Living things and their Habitats</u></p> <p>LT1 describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>LT2 describe the life process of reproduction in some plants and animals.</p> <p><u>Animals, including Humans</u></p> <p>AIH 1 describe the changes as humans develop to old age.</p>	<p><u>Properties and changes of materials</u></p> <p>PM1 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</p> <p>PM2 know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>PM3 use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>PM4 give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>PM5 demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>PM6 explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated</p>	<p><u>Forces</u></p> <p>F1 explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>F2 identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>F3 recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>

		<p>with burning and the action of acid on bicarbonate of soda.</p> <p>Earth and Space</p> <p>ES1 describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>ES2 describe the movement of the Moon relative to the Earth</p> <p>ES3 describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>ES4 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><u>Y5</u> <u>Substantive Knowledge</u></p> <p><u>and</u></p> <p><u>SPECIFICS</u></p>	<p>Animals, including Humans</p> <p><i>Changes happen as humans develop from babies to old age:</i></p> <p><i>Foetus, embryo, babies, toddler, children, teenagers, adults, elderly</i></p> <p><i>Changes experienced in puberty (Link to RSE) - LIGHT TOUCH HERE</i></p>	<p>Properties and changes of materials</p> <p><i>Materials change state by heating and cooling (link to previous learning about water cycle etc)</i></p> <p><i>Dissolving, mixing and changes of state are reversible changes.</i></p> <p><i>Mixtures can be separated using different methods depending on whether they are soluble or insoluble.</i></p> <p><i>Some solid materials are soluble and will dissolve in liquid- it will form a solution.</i></p>	<p>Forces</p> <p><i>Forces make things begin to move, get faster or slow down.</i></p> <p><i>Unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (link back to earth and space)</i></p> <p><i>Friction is a force that slows or stops moving objects and is caused by two surfaces rubbing against each other.</i></p>

	<p>Changes when a body develop into and adult body capable of reproduction. Hormones control these changes and are physical and emotional</p> <p>Males: enlarged scrotum and testes, pubic hair, hair of chest, face, legs and underarm, voice deepens Females: hips widen, breasts develop, pubic hair, hair & underarm, periods start</p> <p>Living things and their Habitats</p> <p>Life cycle of :</p> <p>Amphibian (eggs/spawn; tadpoles (gills), frogs (lungs)</p> <p>Reptiles (eggs, hatchling, juvenile adult)</p> <p>Birds (egg, hatchling, chick, bird)</p> <p>Fish (egg, larva, fry, juvenile, adult)</p> <p>Insect (egg, larva, pupa, adult)</p> <p>Different animals have different gestation periods</p> <p>Most organisms reproduce sexually where offspring inherit information from both parents. Some organisms reproduce asexually by making a copy of a single parent (starfish, komodo dragons, sharks, wasps, ants)</p> <p>Plants can reproduce sexually - pollination and fertilisation (from year 3)</p> <p>Some plants reproduce asexually</p>	<p>Sometimes a substance can be recovered from a solution through evaporation (eg salt in water)</p> <p>Some changes result in the formation of new materials, and this kind of change is usually not reversible. Sometimes mixed substances react to make a new substance. (the action of acid on bicarbonate of soda) These changes are usually irreversible.</p> <p>Heating can sometimes cause materials to change permanently. (changes associated with burning) When this happens, a new substance is made. (wood to charcoal) These changes are irreversible.</p> <p>Indicators that something new has been made are:</p> <ul style="list-style-type: none"> - The properties of the material are different (colour, state, texture, hardness, smell, temperature) - If it is not possible to get the material back easily it is likely that it is not there anymore and something new has been made (irreversible change) <p>When two or more substances are mixed and remain present (a mixture of different sized solids or an insoluble solid and a liquid) the mixture can be separated using sieving (sand and soil), filtering (tea leaves and tea), floating (oil and water) or using magnets (iron pieces in sand).</p> <p>Everyday materials can be grouped and compared according to their properties, including their hardness, solubility,</p>	<p>Air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way.</p> <p>Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move. They allow a smaller force to have a greater effect.</p>
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	<p>- artificial - produce roots from cuttings</p> <p>- natural - bulb, tumour, runner</p> <p>Butterfly Frog Fairy wasp</p>	<p>transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Earth and Space</p> <p>The sun is the star at the centre of our solar system.</p> <p>The solar system has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.</p> <p>The Sun, Earth and Moon are approximately spherical bodies.</p> <p>Stars produce vast amounts of heat and light.</p> <p>All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars.</p> <p>Stars, planets and moons have so much mass they attract other things, including each other due to a force called gravity. Gravity works over distance. (link to forces learning)</p> <p>Objects with larger masses exert bigger gravitational forces. Smaller mass objects like planets orbit large mass objects like stars.</p> <p>Celestial objects like planets, moons and stars spin.</p> <p>The Earth orbits (goes around) the Sun and it takes 1 year to complete its orbit. The Earth is held in its orbit around the Sun by the Sun's gravitational pull.</p>	
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		<p><i>The other planets in our solar system also orbit the sun but at different speeds so their 'year's are different lengths to ours.</i></p> <p><i>A moon is the celestial body that orbits a planet</i></p> <p><i>The Earth has one moon; Jupiter has four Moons and numerous small ones</i></p> <p><i>The Moon orbits the Earth and it takes about 28 days for the Moon to complete its orbit.</i></p> <p><i>The Moon is held in its orbit by Earth's gravitational pull.</i></p> <p><i>The moon DOESN'T change shape. It appears to change shape because we cannot always see the side of the Moon that's in sunlight or we can only see part of the sunlit side of the Moon as it orbits Earth.</i></p> <p><i>The Earth spins on its own axis and takes 24 hours (1 day) to completely rotate.</i></p> <p><i>The side of the Earth facing the Sun is in daytime and the side of the Earth facing away from the Sun is night time.</i></p> <p><i>The Sun doesn't move – it is us that moves. The solar system is heliocentric but in the past we thought it was geocentric. Because the Earth is rotating, the sun appears to move across the sky as the day goes on. (link to y3 light)</i></p>	
<p><u>Y5</u> <u>Vocabulary</u></p>	<p>Living things and their Habitats Insect, Bird, Mammal,Amphibian, Animal, Plant, Lifecycle, Young, Parent, seed, pollen</p>	<p>Properties and changes of materials Hardness, Dissolving Magnetic Mixing, burning, sieving, liquid, vinegar, salt</p>	<p>Forces Force, push, pull, surface</p>

<p>Yellow - words <u>most</u> children will already know</p> <p>Green - new vocabulary to teach and assess against</p> <p>Blue - aspirational vocabulary</p>	<p>Offspring, reproduction, species, metamorphosis, stamen, stigma, filament, style, ovary, pollination, sexual/asexual, reproduction, gestation, germination, seed dispersal</p> <p>endothermic, botanical, parasitic</p> <p>Animals, including Humans</p> <p>Baby, Toddler, Teenager, Young, Elderly, Growth,</p> <p>Foetus, Embryo, Womb, Development, Puberty, Gestation</p> <p>Chromosomes, Fallopian tubes</p>	<p>separate, Solubility, Solution, Soluble, Transparency, Conductivity, Filter, Evaporation, Condensation, Reversible and irreversible changes, bicarbonate of soda</p> <p>Distillation, chemical reaction, combustion</p> <p>Earth and Space</p> <p>Earth, Sun, Moon, Day, Night, star, planets, shadow</p> <p>Axis, Rotation, rotate, Phases of the Moon, constellation, sphere, names of planets, orbit, universe</p> <p>celestial body, asteroids, satellite</p>	<p>Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys, Levers, accelerate, opposing, streamline</p> <p>decelerate</p>
<p><u>Y5 ENQUIRY SKILLS</u></p>	<div data-bbox="539 759 792 916"> <p>Observing Over Time</p>  </div> <p>How do frogs change over their lifetime? (observe closely)</p> <div data-bbox="539 1054 792 1211"> <p>Comparative and Fair Testing</p>  </div> <p>How does age affect a human's reaction time? (to make a prediction)</p>	<div data-bbox="1088 863 1346 1019"> <p>Pattern Seeking</p>  </div> <p>How does the amount of bicarbonate of soda, washing up liquid and vinegar affect the reaction? (gather/record results)</p> <p>Is there a pattern between the size of a planet and the time it takes to travel around the Sun? ((to make a prediction)</p>	<div data-bbox="1637 759 1895 916"> <p>Comparative and Fair Testing</p>  </div> <p>How does the surface area of an object affect the speed of a toy car? (plan an enquiry)</p> <div data-bbox="1637 1054 1895 1211"> <p>Pattern Seeking</p>  </div> <p>How does the surface area of a parachute affect the time it takes to fall? (take measurements and gather/record results)</p>

Pattern Seeking



Is there a relationship between a mammal's size and its gestation period? (**interpret results and draw conclusions**) (**present results**)

Identifying, Classifying and Grouping



Can you **compare** this collection of animals based on similarities and differences in their lifecycle? (**ask scientific questions**)

Identifying, Classifying and Grouping



Can you identify and classify these reactions and changes into reversible, and irreversible? Describe similarities and differences. (**observe closely**)

Can you identify the best methods to separate mixtures? (**interpret results and draw conclusions**)

Research Using Secondary Resources



What are microplastics and why are they harming the planet? What are smart materials and how can they help us?

How have our ideas about the solar system changed over time?

Observing Over Time



Can you observe and identify all the phases in the cycle of the Moon? (**ask scientific questions**)

Identifying, Classifying and Grouping



Can you label and name all the forces acting on the objects in each of these situations? (**observe closely**)

Observing Over Time



How long does a pendulum swing before it stops? (**evaluate an enquiry**)










Research Using Secondary Resources



How do submarines sink if they are full of air?

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Y5 Working Scientifically (Disciplinary Knowledge)

PLAN			DO			REVIEW		
Ask scientific questions	Plan an enquiry	Make a prediction	Observe closely	Take measurements	Gather/record results	Present results	Interpret results/draw conclusions	Evaluate an enquiry
								

Y5 Progression of Skills

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

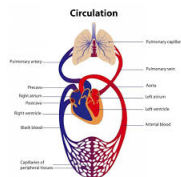
identifying scientific evidence that has been used to support or refute ideas or arguments

Year 6

Y6 THEME

Autumn term 1

The Circulatory System - Have a Heart
Animals, including Humans



Spring Term

Voyage of Discovery!
Evolution and Inheritance
Living things and their Habitats



Summer term 2

Victorians
Light
Electricity

Y6 National Curriculum Programme of Study

Animals, including Humans

AIH1 identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
AIH2 recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
AIH3 describe the ways in which nutrients and water are transported within animals, including humans.

Evolution and Inheritance

EI1 recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
EI2 recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
EI3 identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Living things and their Habitats

Light

L1 recognise that light appears to travel in straight lines
L2 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
L3 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
L4 use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

		<p>LTH1 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</p> <p>LTH2 give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Electricity</p> <p>E1 associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>E2 compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>E3 use recognised symbols when representing a simple circuit in a diagram.</p>
<p><u>Y6</u></p> <p><u>Substantive Knowledge</u></p> <p><u>and</u></p> <p><u>SPECIFICS</u></p>	<p>Animals, including Humans</p> <p><i>The heart has 4 chambers. The heart pumps blood around the body.</i></p> <p><i>Oxygen is breathed into the lungs where it is absorbed by the blood.</i></p> <p><i>The heart pumps the blood around the body through blood vessels to the muscles.</i></p> <p><i>The oxygen in the blood provides energy for our bodies.</i></p> <p><i>Blood which carries oxygen from the lungs into the heart is oxygenated.</i></p>	<p>Evolution and Inheritance</p> <p><i>Living things produce offspring of the same kind but they vary and are not identical to their parents.</i></p> <p><i>Over time the characteristics that are most suited to the environment become increasingly common. Animals and plants are adapted to suit their environment. Adaptation may lead to evolution.</i></p> <p><i>Life cycles have evolved to help organisms survive to adulthood.</i></p> <p><i>The theory of evolution is the process by which different kinds of living organism are believed to</i></p>	<p>Light</p> <p><i>Light travels in straight lines.</i></p> <p><i>Animals see light sources when light travels from the source into their eyes. Animals see objects when light is reflected off that object and enters their eyes.</i></p> <p><i>Light reflects off all objects, unless they are black.</i></p> <p><i>Non-shiny surfaces scatter the light so we don't see the beam. Reflection changes the direction in which the light travels.</i></p>

	<p>Blood which has delivered the oxygen to the muscles and goes back into the heart and then lungs, is deoxygenated</p> <p>Blood carries nutrients throughout the body, it transports and gives oxygen to the body, and prevents you from getting sick!</p> <p>Arteries: blood vessels which carry blood AWAY from the heart</p> <p>Veins: blood vessels which carry blood TOWARDS the heart</p> <p>Alveoli: These are air sacs in the lungs which are surrounded by capillaries to allow the transference of gas</p> <p>Capillaries: small blood vessels which connect arteries and veins</p> <p>Diet, exercise and lifestyle impacts on the way bodies function.</p> <ul style="list-style-type: none"> ● Smoking: Nicotine and chemical cause any diseases (heart disease and cancer). It affects the gas exchange in the lungs. ● Diet: fatty foods (unsaturated fats) raises cholesterol and causes heart disease ● Exercise and heart rate: Improve muscle strength and help the cardiovascular system work efficiently ● Alcohol: lead to cancers, heart disease, digestive problems. It is also linked to mental 	<p>have developed from earlier forms during the history of the earth</p> <p>Living things have changed over time and fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Fossils can be used to find out about the past - Fossils of the simplest organisms are found in the oldest rocks, and fossils of more complex organisms in the newest rocks.</p> <p>Living things and their Habitats</p> <p>Living things can be classified into groups based on characteristics and similarities and differences.</p> <p>Broad groupings (micro-organisms, plants, animals) can be subdivided (commonly found invertebrates - insects, spiders, snails, worms - and vertebrates - fish, amphibians, reptiles, birds, mammals). This can become more and more specific.</p> <p>Organisms best suited to their environment are more likely to survive long enough to reproduce.</p> <p>Organisms that are best adapted to reproduce are more likely to do so. Organisms reproduce and offspring have similar characteristic patterns. Competition exists for resources and mates.</p> <p>Galapagos animals including the Galapagos Penguin, Vampire Finch, Fourwing saltfish, whale fish, green sea lettuce, prickly pear</p>	<p>Shadows have the same shape as the objects that cast them because light travels in straight lines and is stopped by the object.</p> <p>Optical instruments are used to reflect and refract light to form images. They can make enlarged images of distant or small objects. e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.</p> <p>Electricity</p> <p>Batteries are a store of energy. This energy pushes electricity around the circuit. When the battery's energy is gone it stops pushing. Voltage measures the 'push.'</p> <p>More batteries (more voltage) will push the electricity round the circuit faster.</p> <p>Devices work harder when more electricity goes through them. (volume of buzzer, brightness of lamp)</p> <p>Current is how much electricity is flowing round a circuit. Electric current can only flow in one direction.</p> <p>When current flows through wires heat is released. The greater the current, the more heat is released.</p> <p>Resistors (bulbs, buzzers, motors etc) use energy. The more resistors in a circuit, the less energy there is for each of them to use. E.g. two bulbs will shine less brightly than one bulb. Using</p>
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	<p><i>health difficulties, such as depression and anxiety.</i></p> <p>Heart, lungs, blood components link to asthma and BHF</p>	<p>cactus, daisy tree All based on Charles Darwin's voyage</p>	<p><i>more cells or batteries will increase the energy available.</i></p> <p><i>Symbols are used to represent components of a simple circuit.</i></p>
<p>Y6 Vocabulary</p> <p>Yellow - words <u>most</u> children will already know</p> <p>Green - new vocabulary to teach and assess against</p> <p>Blue - aspirational vocabulary</p>	<p>Animals, including Humans</p> <p>Heart, Blood, skeletal, muscular, digestive, oesophagus, small intestine, large intestine</p> <p>Vessels, Veins, Arteries, Valve, Exercise, Respiration, Circulatory</p> <p>oxygenated, deoxygenated, diffusion, osmosis</p>	<p>Living things and their Habitats</p> <p>Amphibians, Reptiles, Mammals, Insects, Vertebrates, Invertebrates, habitats Micro-organisms, Classification</p> <p>Bacteria, key, species</p> <p>Linneneum, arachnid, mollusc, taxonomist</p> <p>Evolution and Inheritance</p> <p>fossils, reproduction , survival, offspring, similarities, differences</p> <p>Adaptation, Evolution, variation , inheritance, parasitic, non identical, identical , environment, conditions , characteristics climate organism</p> <p>Genetics, Survival of the fittest, DNA</p>	<p>Light</p> <p>Light , Reflection, reflective, absence, surface, solid, shadows, light sources, protection,</p> <p>Refraction, Spectrum , angle of incidence, rainbow</p> <p>Parts of the eye - sclera, pupil, lens, optic nerve, cornea, retina</p> <p>Electricity</p> <p>Bulbs, Batteries , Wires</p> <p>Switches, Buzzers, Circuit, Series, Conductors, Insulators, Cell , Amps, Volts, component, crocodile clip , series</p> <p>resistance, current, Parallel Circuit</p>

Y6 ENQUIRY SKILLS

Observing Over Time



How does my heart rate **change over** the day?
(to take measurements and to gather/record results)

Comparative and Fair Testing



Which type of exercise has the greatest effect on our heart rate? (to plan an enquiry)

Pattern Seeking



Can exercising regularly affect your lung capacity? (interpret results)

Identifying, Classifying and Grouping



How would you make a classification key for vertebrates/ invertebrates or microorganisms?
(observe closely)

Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different? (asking scientific questions)

Pattern Seeking



Do all flowers have the same number of petals?
(interpret results/draw conclusions)

Is there a pattern between the size and shape of a bird's beak and the food it will eat? (making a prediction)

Research Using Secondary Resources



What do different types of microorganisms do?
Are they always harmful?

Comparative and Fair Testing



Which material is most reflective? (to gather/record results)

How does the voltage of the batteries in a circuit affect the brightness of the lamp/the volume of the buzzer? (to make a prediction)

Research Using Secondary Resources



Why do some people need to wear glasses to see clearly?

Identifying, Classifying and Grouping



How does light travel? (observe closely)

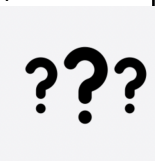






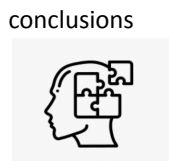

Observing Over Time



How does the brightness of a bulb change as the battery runs out? (to ask)

		What are the 3 main epochs of fossils?	scientific questions
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Y6 Working Scientifically (Disciplinary Knowledge)

PLAN			DO			REVIEW		
Ask scientific questions	Plan an enquiry	Make a prediction	Observe closely	Take measurements	Gather/record results	Present results	Interpret results/draw conclusions	Evaluate an enquiry
								

Y6 Progression of Skills

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.

