

# Science

## Progression Curriculum

**Cycle A 2025 – 2026**

**Cycle B 2026 - 2027**

Cycle A			
Unit	How do animals grow up healthy and strong?	<u>Chemistry / Climatology</u> What are our seasons like?	<u>Biology/ Ecology</u> What do plants need to grow strong and healthy?
Main aims	<ul style="list-style-type: none"> <li>- Identify and name common animals including fish, amphibians, reptiles, birds and mammals.</li> <li>- Describe and compare the structure of a variety of animals.</li> <li>- Know that animals, including humans, have offspring which grow into adults.</li> <li>- Describe the basic needs of animals for survival (water, food, air).</li> <li>- Understand the importance of hygiene, exercise and diet.</li> </ul>	<ul style="list-style-type: none"> <li>- Observe changes across the four seasons.</li> <li>- Describe weather associated with the seasons and how day length varies.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify and name a variety of common wild and garden plants.</li> <li>- Identify and describe the basic structure of flowering plants.</li> <li>- Observe and describe how seeds and bulbs grow into mature plants.</li> <li>- Find out and describe what plants need to grow and stay healthy.</li> </ul>
Key concept	Growth and survival.	Change over time in the natural world.	Growth and life cycles.
Skills	<ul style="list-style-type: none"> <li>- Ask and answer questions using observations.</li> <li>- Sort and classify animals.</li> <li>- Identify similarities and differences.</li> <li>- Use simple data to compare.</li> </ul>	<ul style="list-style-type: none"> <li>- Observe changes over time.</li> <li>- Record data (weather chart).</li> <li>- Use simple equipment (e.g. thermometer, rain gauge).</li> <li>- Talk about evidence from first-hand experience.</li> </ul>	<ul style="list-style-type: none"> <li>- Make observations over time.</li> <li>- Perform simple tests.</li> <li>- Identify and label parts of a plant.</li> <li>- Record findings in drawings and charts.</li> </ul>
Media/Resources	<ul style="list-style-type: none"> <li>- Life cycle posters</li> <li>- Animal sorting cards</li> <li>- Healthy living stories (e.g. <i>Topsy and Tim Go to the Doctor</i>)</li> <li>- BBC Bitesize</li> </ul>	<ul style="list-style-type: none"> <li>- Weather diary</li> <li>- Photos/videos of seasonal changes</li> <li>- Weather poems and songs</li> <li>- BBC Weather</li> </ul>	<ul style="list-style-type: none"> <li>- Seeds and bulbs</li> <li>- Soil, water, pots</li> <li>- Time-lapse videos of growing plants</li> <li>- Books e.g. <i>Jasper's Beanstalk, The Tiny Seed</i></li> </ul>
Vocabulary	offspring, adult, baby, grow, survive, exercise, hygiene, healthy, food, water	spring, summer, autumn, winter, season, weather, temperature, daylight, change	plant, seed, bulb, root, stem, leaf, flower, sunlight, water, soil, grow, healthy

## Key Stage 1 – How to be a Scientist?

Cycle B			
Unit	<p><b><u>Biology</u></b> How do our body parts help us live, move, and explore the world?</p>	<p><b><u>Chemistry</u></b> What material is best for the job?</p>	<p><b><u>Biology</u></b> What do life cycles tell us about how animals and humans grow and change?</p>
Main aims	<ul style="list-style-type: none"> <li>- Identify, name and label the basic parts of the human body.</li> <li>- Know which part of the body is associated with each sense.</li> <li>- Explore how humans use body parts to move, sense, and respond.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify and compare everyday materials based on properties.</li> <li>- Distinguish between an object and the material it is made from.</li> <li>- Describe the simple physical properties of a variety of everyday materials.</li> <li>- Perform tests to find suitable materials for specific purposes.</li> </ul>	<ul style="list-style-type: none"> <li>- Notice that animals, including humans, have offspring which grow into adults.</li> <li>- Describe the basic needs of animals, including humans, for survival.</li> <li>- Understand stages in human and animal growth.</li> </ul>
Key concept	Body parts and senses help humans interact with the world.	Properties and suitability of materials.	Life cycles, growth, and change over time.
Skills	<ul style="list-style-type: none"> <li>- Ask and answer questions based on observations.</li> <li>- Label diagrams (e.g., body parts).</li> <li>- Use senses to explore and describe.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify and classify materials.</li> <li>- Test and compare materials for suitability.</li> <li>- Gather and record data to help answer questions.</li> </ul>	<ul style="list-style-type: none"> <li>- Sequence stages of development.</li> <li>- Compare young and adult animals.</li> <li>- Observe changes over time.</li> <li>- Communicate findings in drawings, tables, or discussions.</li> </ul>

<b>Media/Resources</b>	<ul style="list-style-type: none"> <li>- Body outline templates</li> <li>- Senses exploration stations</li> <li>- Songs (e.g. <i>Heads, Shoulders, Knees and Toes</i>)</li> <li>- BBC Bitesize</li> </ul>	<ul style="list-style-type: none"> <li>- Feely bags</li> <li>- Magnet, water, and durability tests</li> <li>- Materials sorting cards</li> <li>- Books e.g. <i>The Great Paper Caper</i></li> </ul>	<ul style="list-style-type: none"> <li>- Life cycle diagrams (frog, chick, human)</li> <li>- Photos or videos showing animal development</li> <li>- Books e.g. <i>Once There Were Giants</i></li> </ul>
<b>Vocabulary</b>	body, head, arms, legs, eyes, ears, nose, mouth, touch, smell, taste, hear, see	material, property, smooth, rough, waterproof, absorbent, hard, soft, stretchy, bendy	life cycle, grow, change, baby, child, adult, egg, hatch, survive, needs

	<b>KS1 Endpoints</b>
<b>Knowledge and understanding</b>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li><input type="checkbox"/> identify and describe the basic structure of a variety of common flowering plants, including trees.</li> <li><input type="checkbox"/> identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li><input type="checkbox"/> identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li><input type="checkbox"/> describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</li> <li><input type="checkbox"/> identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</li> <li><input type="checkbox"/> distinguish between an object and the material from which it is made</li> <li><input type="checkbox"/> identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li><input type="checkbox"/> describe the simple physical properties of a variety of everyday materials</li> <li><input type="checkbox"/> compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> <li><input type="checkbox"/> observe and describe how seeds and bulbs grow into mature plants</li> <li><input type="checkbox"/> find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> <li><input type="checkbox"/> notice that animals, including humans, have offspring which grow into adults</li> <li><input type="checkbox"/> find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li><input type="checkbox"/> describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> <li><input type="checkbox"/> identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li><input type="checkbox"/> find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul>

	<ul style="list-style-type: none"> <li><input type="checkbox"/> explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li><input type="checkbox"/> identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</li> <li><input type="checkbox"/> identify and name a variety of plants and animals in their habitats, including microhabitats</li> <li><input type="checkbox"/> describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</li> </ul>
<b>Enquiry and Critical Thinking</b>	<p>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> asking simple questions and recognising that they can be answered in different ways</li> <li><input type="checkbox"/> observing closely, using simple equipment</li> <li><input type="checkbox"/> performing simple tests</li> <li><input type="checkbox"/> identifying and classifying</li> <li><input type="checkbox"/> using their observations and ideas to suggest answers to questions</li> <li><input type="checkbox"/> gathering and recording data to help in answering questions.</li> </ul>

**LKS2 – Becoming a Scientist**

**Cycle A**

<b>Unit</b>	<u><i>Biology</i></u> What do skeletons and muscles do?	<u><i>Biology</i></u> What do humans need to stay healthy?	<u><i>Chemistry/ Geology</i></u> What's beneath our feet?	<u><i>Chemistry</i></u> How do materials change state?	<u><i>Physics</i></u> How do sounds travel?	<u><i>Physics</i></u> Why are magnets marvellous?
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<b>Main aims</b>	<ul style="list-style-type: none"> <li>- Identify that humans and some animals have skeletons and muscles for support, protection and movement.</li> </ul>	<ul style="list-style-type: none"> <li>- Recognise the importance of a balanced diet and the impact of nutrition and exercise on health.</li> </ul>	<ul style="list-style-type: none"> <li>- Compare and group rocks based on appearance and properties.</li> <li>- Understand how fossils are formed.</li> <li>- Recognise that soils are made from rocks and organic matter.</li> </ul>	<ul style="list-style-type: none"> <li>- Group materials as solids, liquids or gases.</li> <li>- Observe changes of state through heating and cooling.</li> <li>- Understand evaporation and condensation in the water cycle.</li> </ul>	<ul style="list-style-type: none"> <li>Identify how sounds are made through vibration.</li> <li>- Recognise vibrations travel through a medium to the ear.</li> <li>- Explore pitch and volume.</li> </ul>	<ul style="list-style-type: none"> <li>Explore how magnets attract and repel.</li> <li>- Identify magnetic and non-magnetic materials.</li> <li>- Understand magnetic poles and forces.</li> </ul>
<b>Key concept</b>	Muscles and bones help movement and provide support and protection.	Good nutrition and exercise are key to keeping healthy.	Rocks, fossils, and soil tell us about Earth's structure.	Materials change state through heating and cooling.	Sound is made by vibrations and travels through materials.	Magnets exert forces and can attract certain materials.
<b>Skills</b>	<ul style="list-style-type: none"> <li>- Make systematic observations.</li> <li>- Use models and diagrams.</li> <li>- Ask relevant questions.</li> </ul>	<ul style="list-style-type: none"> <li>- Conduct simple tests on food/exercise.</li> <li>- Use results to draw conclusions.</li> <li>- Record data in tables or charts.</li> </ul>	<ul style="list-style-type: none"> <li>- Classify types of rocks and soils.</li> <li>- Use secondary sources for fossils.</li> <li>- Record using drawings and notes.</li> </ul>	<ul style="list-style-type: none"> <li>- Observe and record temperature changes.</li> <li>- Measure accurately.</li> <li>- Set up fair tests.</li> </ul>	<ul style="list-style-type: none"> <li>- Investigate pitch and volume.</li> <li>- Make labelled diagrams.</li> <li>- Use data loggers or sound meters.</li> </ul>	<ul style="list-style-type: none"> <li>- Test materials with magnets.</li> <li>- Compare surfaces and movement.</li> <li>- Use results to explain ideas.</li> </ul>
<b>Media/Resources</b>	<ul style="list-style-type: none"> <li>- Skeleton models</li> <li>- Jointed puppets</li> <li>- Balloon and string "muscles"</li> <li>- Body diagrams</li> </ul>	<ul style="list-style-type: none"> <li>- Eatwell plate</li> <li>- Food sorting cards</li> <li>- PE and fitness challenges</li> </ul>	<ul style="list-style-type: none"> <li>- Rock collections</li> <li>- Fossil replicas</li> <li>- Soil samples and sieves</li> </ul>	<ul style="list-style-type: none"> <li>- Thermometers</li> <li>- Ice/water experiments</li> <li>- Water cycle model</li> </ul>	<ul style="list-style-type: none"> <li>- String phones</li> <li>- Tuning forks</li> <li>- Sound data apps</li> </ul>	<ul style="list-style-type: none"> <li>- Bar magnets</li> <li>- Magnetic/non-magnetic object trays</li> <li>- Iron filings</li> </ul>
<b>Vocabulary</b>	skeleton, bone, muscle, joint,	balanced diet, nutrients, vitamins,	rock, fossil, soil, sedimentary, igneous,	solid, liquid, gas, melt, freeze, evaporate,	vibration, pitch, volume, sound	magnet, magnetic, repel, attract, force, pole, north, south

support, protection, movement	minerals, exercise, energy	metamorphic, erosion	condense, temperature	wave, medium, ear, source	
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LKS2 – Becoming a Scientist

Cycle B						
Unit	<b><i>Biology</i></b> How can we group animals and plants?	<b><i>Biology/ Ecology</i></b> What impacts eco-systems?	<b><i>Physics</i></b> How does electricity travel?	<b><i>Physics</i></b> How does light dance and hide?	<b><i>Biology</i></b> Digestive system	<b><i>Biology</i></b> How do flowers grow?
Main aims	Classify living things based on observable features (e.g., vertebrates/invertebrates, flowering/non-flowering plants).	Understand food chains, habitats, and human impacts (pollution, deforestation).	Build simple circuits; explore conductors/insulators.	Investigate reflection, shadows, and light travel.	Identify digestive organs and their functions.	Explore plant reproduction (pollination, seeds, growth).
Key concept	<ul style="list-style-type: none"> <li>- Classification systems (e.g., Linnaean groups).</li> <li>- Shared characteristics (e.g., mammals have fur, birds lay eggs).</li> <li>- Microhabitats and adaptations (e.g., desert vs. rainforest plants).</li> </ul>	<ul style="list-style-type: none"> <li>- Interdependence (predator-prey relationships).</li> <li>- Human impacts (positive/negative, e.g., recycling vs. pollution).</li> <li>- Biodiversity and its importance.</li> </ul>	<ul style="list-style-type: none"> <li>- Complete circuits (power source, conductor, output).</li> <li>- Conductors vs. insulators (metals vs. plastic).</li> <li>- Safety with electricity.</li> </ul>	<ul style="list-style-type: none"> <li>- Light travels in straight lines (evidence: shadows).</li> <li>- Reflection (mirrors, angles of light).</li> <li>- Transparent/opaque materials.</li> </ul>	<ul style="list-style-type: none"> <li>- Stages of digestion (mouth → intestines).</li> <li>- Role of enzymes (breaking down food).</li> <li>- Balanced diets and nutrient absorption.</li> </ul>	<ul style="list-style-type: none"> <li>- Parts of a flower (petals, stamen, stigma).</li> <li>- Pollination methods (wind, insects).</li> <li>- Seed dispersal (animals, water, explosion).</li> </ul>
Skills	- Observing and recording physical traits.	- Constructing food chains	- Building circuits (series vs. parallel).	- Measuring shadows	- Labelling diagrams	- Dissecting flowers

	<ul style="list-style-type: none"> <li>- Using classification keys (dichotomous keys).</li> <li>- Researching species (books/digital tools).</li> <li>- Grouping collaboratively (peer discussion).</li> </ul>	<p>(producer → top predator).</p> <ul style="list-style-type: none"> <li>- Analyzing data (e.g., pollution levels).</li> <li>- Debating human impacts (class discussion).</li> <li>- Fieldwork (local habitat surveys).</li> </ul>	<ul style="list-style-type: none"> <li>- Testing materials (conductivity experiments).</li> <li>- Problem-solving (e.g., fixing a broken circuit).</li> <li>- Recording results (drawing circuit diagrams).</li> </ul>	<p>(length/direction changes).</p> <ul style="list-style-type: none"> <li>- Predicting reflections (angle investigations).</li> <li>- Designing experiments (e.g., periscopes).</li> <li>- Using scientific language (e.g., "refraction").</li> </ul>	<p>(digestive system).</p> <ul style="list-style-type: none"> <li>- Modelling processes (e.g., "digestive dance").</li> <li>- Comparing diets (herbivore vs. omnivore).</li> <li>- Presenting findings (posters, presentations).</li> </ul>	<p>(identifying parts).</p> <ul style="list-style-type: none"> <li>- Tracking plant growth (measurements, diaries).</li> <li>- Investigating variables (light/water effects).</li> <li>- Creative seed dispersal models (e.g., "helicopter seeds").</li> </ul>
<b>Media/Resources</b>	Animal/plant cards, classification keys, microscopes.	Food chain games, documentaries (e.g., BBC Earth), local habitat surveys.	Circuit kits, batteries, bulbs, conductive materials (foil, coins).	Torches, mirrors, prisms, shadow puppets, blackout materials.	Digestive system models, videos (e.g., "The Journey of Food"), food diaries.	Seeds, soil, magnifying glasses, time-lapse videos (e.g., bean growth).
<b>Vocabulary</b>	Vertebrate, invertebrate, species, adaptation, microhabitat.	Producer, consumer, decomposer, biodiversity, sustainability.	Circuit, conductor, insulator, component, switch.	Reflect, refract, transparent, opaque, shadow.	Oesophagus, stomach, enzymes, absorption.	Pollination, germination, dispersal, stigma, stamen.

	LKS2 Endpoints
Knowledge and understanding	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>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</li> <li>investigate the way in which water is transported within plants</li> <li>explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> <li>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</li> <li>identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> <li>compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>recognise that soils are made from rocks and organic matter.</li> <li>recognise that they need light in order to see things and that dark is the absence of light</li> <li>notice that light is reflected from surfaces</li> <li>recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>find patterns in the way that the size of shadows change.</li> <li>compare how things move on different surfaces</li> <li>notice that some forces need contact between two objects, but magnetic forces can act at a distance <ul style="list-style-type: none"> <li>observe how magnets attract or repel each other and attract some materials and not others</li> </ul> </li> <li>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</li> <li>describe magnets as having two poles</li> <li>predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> <li>recognise that living things can be grouped in a variety of ways <ul style="list-style-type: none"> <li>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> </ul> </li> <li><input type="checkbox"/> recognise that environments can change and that this can sometimes pose dangers to living things.</li> <li><input type="checkbox"/> describe the simple functions of the basic parts of the digestive system in humans</li> <li><input type="checkbox"/> identify the different types of teeth in humans and their simple functions</li> <li><input type="checkbox"/> construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>

	<ul style="list-style-type: none"> <li><input type="checkbox"/> compare and group materials together, according to whether they are solids, liquids or gases</li> <li><input type="checkbox"/> observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</li> <li><input type="checkbox"/> identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> <li><input type="checkbox"/> identify how sounds are made, associating some of them with something vibrating</li> <li><input type="checkbox"/> recognise that vibrations from sounds travel through a medium to the ear</li> <li><input type="checkbox"/> find patterns between the pitch of a sound and features of the object that produced it</li> <li><input type="checkbox"/> find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li><input type="checkbox"/> recognise that sounds get fainter as the distance from the sound source increases.</li> <li><input type="checkbox"/> identify common appliances that run on electricity</li> <li><input type="checkbox"/> construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li><input type="checkbox"/> identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</li> <li><input type="checkbox"/> recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li><input type="checkbox"/> recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>
Enquiry and Critical Thinking	<p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> asking relevant questions and using different types of scientific enquiries to answer them</li> <li><input type="checkbox"/> setting up simple practical enquiries, comparative and fair tests</li> <li><input type="checkbox"/> making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li><input type="checkbox"/> gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</li> <li><input type="checkbox"/> recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li><input type="checkbox"/> reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li><input type="checkbox"/> using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li><input type="checkbox"/> identifying differences, similarities or changes related to simple scientific ideas and processes</li> <li><input type="checkbox"/> using straightforward scientific evidence to answer questions or to support their findings.</li> </ul>

Cycle A						
Unit	<u><b>Biology</b></u> How do we take care of our amazing bodies?	<u><b>Biology</b></u> How do living things evolve?	<u><b>Chemistry</b></u> What make materials mix, change and get magical?	<u><b>Physics</b></u> How does light travel?	<u><b>Physics</b></u> How do electrical circuits work?	<u><b>Physics</b></u> How do forces affect movement?
Main aims	Investigate holistic health (physical and mental wellbeing)	Understand adaptation, natural selection, and fossil evidence.	Investigate states of matter, dissolving, and irreversible changes.	Study light properties (reflection, refraction) and the eye.	Build complex circuits (series/parallel) and understand symbols.	Analyze forces (gravity, friction, air resistance) and mechanisms (gears, pulleys).
Key concept	<ul style="list-style-type: none"> <li>- Essential nutrients (macronutrients and micronutrients)</li> <li>- Benefits of different exercise types</li> <li>- Importance of sleep hygiene</li> <li>- Mental health awareness (stress management)</li> </ul>	<ul style="list-style-type: none"> <li>- Adaptation (camouflage, beak shapes).</li> <li>- Fossils as evidence.</li> <li>- Darwin's theory (simple explanation).</li> </ul>	<ul style="list-style-type: none"> <li>- Particle theory (solids/liquids/gases).</li> <li>- Dissolving (solute/solvent).</li> <li>- Irreversible changes (burning, rusting).</li> </ul>	<ul style="list-style-type: none"> <li>- Light rays (straight lines).</li> <li>- Refraction (lenses, prisms).</li> <li>- How the eye works.</li> </ul>	<ul style="list-style-type: none"> <li>- Circuit components (motors, buzzers).</li> <li>- Voltage (simple concept).</li> <li>- Symbols (standard diagrams).</li> </ul>	<ul style="list-style-type: none"> <li>Balanced/unbalanced forces.</li> <li>- Friction (surfaces, drag).</li> <li>- Simple machines (levers, pulleys).</li> </ul>

Skills	<p>Design balanced meal plans</p> <p>Conduct fitness</p> <p>Analyse nutritional information</p> <p>Discuss mental wellbeing strategies</p>	<ul style="list-style-type: none"> <li>- Analyzing adaptations (case studies).</li> <li>- Interpreting fossil records.</li> <li>- Debating evolution (class discussion).</li> </ul>	<ul style="list-style-type: none"> <li>- Separating mixtures (filtering, evaporation).</li> <li>- Observing state changes (melting ice).</li> <li>- Recording chemical reactions.</li> </ul>	<ul style="list-style-type: none"> <li>- Measuring angles of reflection/refraction.</li> <li>- Designing periscopes.</li> <li>- Eye dissection (virtual/model).</li> </ul>	<ul style="list-style-type: none"> <li>- Constructing parallel circuits.</li> <li>- Troubleshooting faults.</li> <li>- Drawing circuit diagrams.</li> </ul>	<ul style="list-style-type: none"> <li>- Investigating friction (ramps, surfaces).</li> <li>- Designing parachutes (air resistance).</li> <li>- Building lever systems.</li> </ul>
Media/Resources	<p>Food packaging examples</p> <p>Fitness trackers</p> <p>Sleep diaries</p> <p>Mental health resources</p>	<p>Fossil replicas, BBC Bitesize evolution animations, bird beak tools.</p>	<p>Ice/steam experiments, filtration kits, vinegar/baking soda reactions.</p>	<p>Mirrors, lenses, laser pointers, eye models, prism kits.</p>	<p>Advanced circuit kits, motors, switches, circuit symbol flashcards.</p>	<p>Force meters, pulleys, parachute materials, LEGO Simple Machines kits.</p>
Vocabulary	<p>Nutrients, carbohydrates, proteins, vitamins, minerals, hydration, endorphins.</p>	<p>Evolution, adaptation, natural selection, fossil, extinct.</p>	<p>Dissolve, soluble, insoluble, chemical reaction, irreversible.</p>	<p>Reflection, refraction, spectrum, cornea, retina.</p>	<p>Series/parallel circuit, conductor, insulator, voltage, component.</p>	<p>Gravity, friction, air resistance, buoyancy, mechanical advantage.</p>

## UPKS2 – Becoming a Scientist

Cycle B					
Unit	<p><b><i>Biology</i></b> How and why does blood travel around your body?</p>	<p><b>Biology</b> How do humans change with age?</p>	<p><b><i>Biology</i></b> How do different organisms reproduce and change?</p>	<p><b><i>Physics</i></b> How do the planets and sun move in harmony?</p>	<p><b><i>Biology</i></b> How do scientists classify living things?</p>

<b>Main aims</b>	Understand the structure and function of the circulatory system	Explore human growth, puberty, and aging processes.	Compare reproductive strategies across different life forms	Explore cosmic mechanics (gravity, orbits, seasons)	Apply taxonomic principles to classify diverse organisms
<b>Key concept</b>	<ul style="list-style-type: none"> <li>- Double circulation system (pulmonary and systemic circuits)</li> <li>- Heart structure (4 chambers, valves)</li> <li>- Blood components (red/white cells, platelets, plasma)</li> <li>- Relationship between exercise and cardiovascular health</li> </ul>	<ul style="list-style-type: none"> <li>- Life stages (infancy to old age).</li> <li>Puberty (physical/emotional changes).</li> <li>- Healthy aging (diet, exercise).</li> </ul>	<ul style="list-style-type: none"> <li>- Sexual vs asexual reproduction</li> <li>- Pollination mechanisms (wind, insects)</li> <li>- Metamorphosis (complete vs incomplete)</li> <li>- Environmental adaptations for reproduction</li> </ul>	<ul style="list-style-type: none"> <li>- Solar system structure (planets, moons)</li> <li>- Gravity's role in orbital mechanics</li> <li>- Earth's axial tilt and seasons</li> <li>- Day/night cycle explanation</li> </ul>	<ul style="list-style-type: none"> <li>- Taxonomic hierarchy (kingdom to species)</li> <li>- Evolutionary relationships</li> <li>- Dichotomous key usage</li> <li>- Microorganism classification</li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>- Measure and record pulse rates</li> <li>- Create blood flow models</li> <li>- Interpret heart diagrams</li> <li>- Debate lifestyle impacts on health</li> </ul>	<ul style="list-style-type: none"> <li>- Graphing growth data (height/weight).</li> <li>- Discussing puberty (sensitivity).</li> <li>- Researching aging (scientific sources).</li> </ul>	<ul style="list-style-type: none"> <li>- Dissect flowers to study reproductive structures</li> <li>- Observe and record life cycles</li> <li>- Compare reproductive methods across species</li> <li>- Use microscopes</li> </ul>	<ul style="list-style-type: none"> <li>- Build scale models of the solar system</li> <li>- Simulate planetary orbits</li> <li>- Construct and use sundials</li> <li>- Explain seasonal changes</li> </ul>	<ul style="list-style-type: none"> <li>- Apply dichotomous keys to identify species</li> <li>- Group organisms by characteristics</li> <li>- Debate classification controversies</li> <li>- Research evolutionary traits</li> </ul>

			to examine gametes		
<b>Media/Resources</b>	<ul style="list-style-type: none"> <li>- Stethoscopes</li> <li>- Heart models</li> <li>- Blood flow simulation kits</li> <li>- Pulse monitors</li> </ul>	Growth charts, puberty education videos, lifespan timelines.	<ul style="list-style-type: none"> <li>- Flower dissection kits</li> <li>- Butterfly life cycle sets</li> <li>- Microscopes and slides</li> <li>- Timelapse videos</li> </ul>	<ul style="list-style-type: none"> <li>- Solar system models</li> <li>- Planetarium software</li> <li>- Torch and globe sets</li> <li>- Orrery kits</li> </ul>	<ul style="list-style-type: none"> <li>- Classification charts</li> <li>- Field guides</li> <li>- Microscopes</li> <li>- Fossil replicas</li> </ul>
<b>Vocabulary</b>	Arteries, veins, capillaries, hemoglobin, plasma, systolic, diastolic	Puberty, adolescence, lifespan, hormones, development.	Pollination, fertilization, gametes, zygote, metamorphosis, spores	Orbit, revolution, rotation, gravity, axis, equinox, solstice	Taxonomy, species, genus, vertebrate, invertebrate, cladogram
<b>UPKS2 – Becoming a Scientist</b>					

UPKS2 Endpoints	
<b>Knowledge and understanding</b>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li><input type="checkbox"/> describe the life process of reproduction in some plants and animals.</li> <li><input type="checkbox"/> describe the changes as humans develop to old age.</li> <li><input type="checkbox"/> 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</li> <li><input type="checkbox"/> know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li><input type="checkbox"/> use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li><input type="checkbox"/> give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li><input type="checkbox"/> demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li><input type="checkbox"/> explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</li> <li><input type="checkbox"/> describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li><input type="checkbox"/> describe the movement of the Moon relative to the Earth</li> <li><input type="checkbox"/> describe the Sun, Earth and Moon as approximately spherical bodies</li> <li><input type="checkbox"/> use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li> <li><input type="checkbox"/> explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li><input type="checkbox"/> identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li><input type="checkbox"/> recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> <li><input type="checkbox"/> describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals</li> <li><input type="checkbox"/> give reasons for classifying plants and animals based on specific characteristics.</li> <li><input type="checkbox"/> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li><input type="checkbox"/> recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li><input type="checkbox"/> describe the ways in which nutrients and water are transported within animals, including humans.</li> <li><input type="checkbox"/> recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li><input type="checkbox"/> recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li><input type="checkbox"/> identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li> </ul>

	<ul style="list-style-type: none"> <li><input type="checkbox"/> recognise that light appears to travel in straight lines</li> <li><input type="checkbox"/> 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</li> <li><input type="checkbox"/> 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</li> <li><input type="checkbox"/> use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> <li><input type="checkbox"/> associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li><input type="checkbox"/> 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</li> <li><input type="checkbox"/> use recognised symbols when representing a simple circuit in a diagram.</li> </ul>
<b>Expressing Ideas and Insights</b>	<ul style="list-style-type: none"> <li>• Pupils should explore and discuss their ideas and ask their own questions about scientific phenomena.</li> <li>• They should analyse functions, relationships, and interactions in a more systematic way.</li> <li>• Pupils should begin to engage with more abstract scientific concepts.</li> <li>• They should start to understand how these abstract ideas help explain and predict how the world works.</li> <li>• Pupils should recognise that scientific ideas can change and develop over time.</li> <li>• They should choose appropriate methods to answer scientific questions using a variety of enquiry types, such as: <ul style="list-style-type: none"> <li>○ Observing changes over time</li> <li>○ Noticing patterns</li> <li>○ Grouping and classifying</li> <li>○ Conducting comparative and fair tests</li> <li>○ Using a wide range of secondary sources</li> </ul> </li> <li>• Pupils should draw conclusions from their data and observations.</li> <li>• They should use evidence to justify their ideas.</li> <li>• They should apply scientific knowledge and understanding to explain their findings.</li> <li>• ‘Working and thinking scientifically’ must always be taught through and connected to the substantive science content in the programme of study.</li> <li>• Pupils should read, spell, and pronounce scientific vocabulary correctly.</li> </ul>
<b>Enquiry and Critical Thinking</b>	<p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li><input type="checkbox"/> taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li><input type="checkbox"/> recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li><input type="checkbox"/> using test results to make predictions to set up further comparative and fair tests</li> </ul>

- 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.