

	Key Stage 1	Year 3	Year 4	Year 5	Year 6	Key Stage 3
Plants Biology	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>Explore the requirements of plants life and growth (air, light, water, nutrients from soil, and room to grow) and they vary from plant to plant</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>Vocabulary: Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair</p>				<p>Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.</p>

Animals including humans
Biology

Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals

Identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)

Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

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

Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)

Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.

Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Key Vocabulary (substantive knowledge):
Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine

Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair

Describe the simple functions of the basic parts of the digestive system in humans.

Identify the different types of teeth in humans and their simple functions

Construct and interpret a variety of food chains, identifying producers, predators and prey.

Key Vocabulary:
Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain

Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair

Describe the changes as humans develop to old age.

Key Vocabulary:
Puberty – the vocabulary to describe sexual characteristics

Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair, plan, variables, measurements, accuracy, precision, diagrams, comparative, report,

Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood

Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function

Describe the ways in which nutrients and water are transported within animals, including humans.

Key Vocabulary:
Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle

Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair, plan, variables, measurements, accuracy, precision, diagrams, comparative, report,

Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta.

The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases.

The effects of recreational drugs (including substance misuse) on behaviour, health and life processes.

The structure and functions of the gas exchange system in humans, including adaptations to function.

The mechanism of breathing to move air in and out of the lungs.

The impact of exercise, asthma and smoking on the human gas exchange system.

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Living things and their habitats Biology</p>	<p>Explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p> <p>Identify and name a variety of plants and animals in their habitats, including microhabitats</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>		<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p>Key Vocabulary: Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals.</p> <p>Key Vocabulary: Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair, plan, variables, measurements, accuracy, precision, diagrams, comparative, report,</p>	<p>I can 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>I can give reasons for classifying plants and animals based on specific characteristics.</p> <p>Key Vocabulary: Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair, plan, variables, measurements, accuracy, precision, diagrams, comparative, report,</p>	<p>Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta.</p> <p>Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.</p> <p>Differences between species.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Evolution and inheritance Biology</p>					<p>I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p>Key Vocabulary: Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair, plan, variables, measurements, accuracy, precision, diagrams, comparative, report,</p>	<p>Heredity as the process by which genetic information is transmitted from one generation to the next.</p> <p>A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model.</p> <p>The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection.</p> <p>Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.</p>

Rocks Chemistry/physics		<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from rocks and organic matter.</p> <p>Key Vocabulary: Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair</p>				<p>The composition of the Earth.</p> <p>The structure of the Earth.</p> <p>The rock cycle and the formation of igneous, sedimentary and metamorphic rocks</p>
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<p style="text-align: center;">States of matter Properties and changes of materials Chemistry</p>	<p>Distinguish between an object and the material from which it is made Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock Describe the simple physical properties of a variety of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>		<p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>Key Vocabulary: Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair</p>	<p>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>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p> <p>Key Vocabulary: Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair, plan, variables, measurements, accuracy, precision, diagrams, comparative, report,</p>		<p>Chemical reactions as the rearrangement of atoms.</p> <p>Representing chemical reactions using formulae and using equations.</p> <p>Combustion, thermal decomposition, oxidation and displacement reactions.</p> <p>Defining acids and alkalis in terms of neutralisation reactions.</p> <p>The pH scale for measuring acidity/alkalinity; and indicators.</p>
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<p style="text-align: center;">Light Physics</p>		<p>I can recognise that they need light in order to see things and that dark is the absence of light I can notice that light is reflected from surfaces I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes I can recognise that shadows are formed when the light from a light source is blocked by a solid object I can find patterns in the way that the size of shadows change.</p> <p>Key Vocabulary: Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair</p>			<p>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye I can 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</p> <p>use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>Key Vocabulary: Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous straight lines, light rays</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair, plan, variables, measurements, accuracy, precision, diagrams, comparative, report,</p>	<p>The similarities and differences between light waves and waves in matter. Light waves travelling through a vacuum; speed of light. The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye. Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection</p>
<p style="text-align: center;">Sound physics</p>		<p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p> <p>Key Vocabulary: Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair</p>				<p>Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition. Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. Sound needs a medium to travel, the speed of sound in air, in water, in solids. Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. Auditory range of humans and animals. Pressure waves transferring energy; use for cleaning and physiotherapy by ultrasound. Waves transferring information for conversion to electrical signals by microphone.</p>

Electricity
Physics

Identify common appliances that run on electricity

Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers

Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery

Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit

Recognise some common conductors and insulators, and associate metals with being good conductors.

Key Vocabulary:
Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol

Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair

Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit

Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches

Use recognised symbols when representing a simple circuit in a diagram.

Key Vocabulary:
Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage

Note: Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.

Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair, plan, variables, measurements, accuracy, precision, diagrams, comparative, report,

Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge.

Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. Differences in resistance between conducting and insulating components (quantitative). Static electricity.

<p style="text-align: center;">Earth and Space Physics</p>	<p>Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies.</p>			<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth I can describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p>Key Vocabulary: Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets</p> <p>Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair, plan, variables, measurements, accuracy, precision, diagrams, comparative, report,</p>		<p>The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. Gravity force, weight = mass x gravitational field strength (g), on Earth $g=10 \text{ N/kg}$, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). Our Sun as a star, other stars in our galaxy, other galaxies. The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. The light year as a unit of astronomical distance.</p>
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Forces and magnets
Physics

Compare how things move on different surfaces

Notice that some forces need contact between two objects, but magnetic forces can act at a distance

Observe how magnets attract or repel each other and attract some materials and not others describe magnets as having two poles

Predict whether two magnets will attract or repel each other, depending on which poles are facing.

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

Key Vocabulary:
Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole

Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair

Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.

Identify the effects of air resistance, water resistance and friction, that act between moving surfaces

Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Key Vocabulary:
Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears

Key Vocabulary (disciplinary knowledge): research, data, equipment, record, observe, identify, classify, pattern, fair, plan, variables, measurements, accuracy, precision, diagrams, comparative, report,

Magnetic fields by plotting with compass, representation by field lines. Earth's magnetism, compass and navigation.

Forces as pushes or pulls, arising from the interaction between two objects. Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces.

Moment as the turning effect of a force. Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water.

Forces measured in Newtons, measurements of stretch or compression as force is changed

Scientific Enquiry Skills

Year 3		Year 4		Year 5		Year 6	
Words	Phrases	Words	Phrases	Words	Phrases	Words	Phrases
Identify Describe Investigate Explore Recognise Compare Notice Observe Group Predict	Find patterns	Recognise Explore Describe Identify Observe Construct	Use classification keys Construct and interpret Compare and group Find patterns	Describe Know Demonstrate Explain Identify Name	Compare and group Use knowledge of Give reasons Use the idea that	Describe Identify Recognise Explain Demonstrate Use Compare Associate	Give reasons Use the idea that...

