Curriculum Overview.

Intent

At the Blue Hills Federation, we recognise the importance of Science in daily life. As one of the core subjects taught in Primary Schools, we give the teaching and learning of Science the prominence it requires.
The Scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with Science as a process of enquiry. Through high quality planning and teaching we will develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence.
At the Blue Hills Federation, in conjunction with the aims of the National Curriculum, our Science teaching offers opportunities for children to:

- Develop scientific substantive and disciplinary knowledge through the teaching of Biology, Chemistry and Physics.
- Develop understanding of the nature, processes and methods of Science through different types of enquiries that help them to ask and answer scientific questions about the world around them.
- Be equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.
- Use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, including I.C.T., diagrams, graphs and charts.
- Develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.
- Develop an enthusiasm and enjoyment of scientific learning and discovery.

At the Blue Hills Federation, children have weekly lessons in Science throughout Key Stage 1 and 2. In Early Years, Science is taught through the children learning about the world around them. This will happen through direct teaching or children accessing structured play activities. Additional opportunities to explore Science are provided through educational visits and using the local environment.
We endeavour to ensure that the Science curriculum we provide will give children the confidence and motivation to continue to further develop their skills into the next stage of their education and life experiences.

Implementation

Teachers create a positive attitude to Science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in Science. Our whole school approach to the teaching and learning of Science involves the following:

- Science will be taught in planned and arranged units by the class teacher. This is a strategy to enable the achievement of a greater depth of knowledge.
- Through our planning, we involve problem solving opportunities that allow children to find out for themselves. Children are encouraged to ask their own questions and are given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge.
- Teachers use precise questioning in class to test knowledge and assess children regularly to identify those children with gaps in learning, so that all children keep up.

- Formative and summative assessments are made.
- We build upon the learning and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Substantive and disciplinary knowledge are embedded into lessons to ensure these skills are being developed throughout the children's school career. New vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in keeping with the units of learning.
- We employ a qualified and experienced science teacher for 1 day a week to work across the Federation and to support teachers with the planning and delivery of the science curriculum to ensure that our Science curriculum prepared pupils appropriately for Key Stage 3 with knowledge, method and vocabulary.
- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding.
- Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning.
- Pupil voice is used to further develop the Science curriculum, through questioning of pupil's views and attitudes to Science to support the children's enjoyment of Science.

Impact

The successful approach at the Blue Hills Federation school means that:

- Children enjoy and are enthusiastic about science in our school.
- There is a clear progression of children's work and teachers' expectations in our schools.
- Children are ready for their next steps in Science learning as they move through school and onto Secondary School.
- Children's work shows a range of units and evidence of the curriculum coverage for all Science topics.
- Children are becoming increasingly independent in Science, selecting their own tools and materials, completing pupil lead investigations and choosing their own strategies for recording.
- Standards in Science at the end of the key stages are good and issues arising are addressed effectively in school.

Please note that Newcastle CE Primary School KS2 has four year groups in a class and will look at a lower key stage 2 area and a upper key stage 2 area in each term. They will follow the pattern below.

Year A	Forces and Magnets Earth and Space	Light States of Matter	Plants Living things and their Habitats
Year B	Rocks Properties of Materials	Electricity Sound	Animals including Humans Evolutions and Inheritance

EYFS

The EYFS framework is structured very differently to the national curriculum as it is organised across seven areas of learning rather than subject areas. The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Three and Four-Year-Olds and Reception to match the programme of study for science. The most relevant statements for science are taken from the following area of learning: Communication and Language, Personal, Social and Emotional Development and Understanding of the World.

Science		
Three and Four Year Olds	Communication and Language	• Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
	Personal, Social and Emotional Development	• Make healthy choices about food, drink, activity and toothbrushing.
	Understanding the World	• Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about what they see, using a wide vocabulary. • Begin to make sense of their own life-story and family's history. • Explore how things work. • Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice.
Reception	Communication and Language	• Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • Use new vocabulary in different contexts.
	Personal, Social and Emotional Development	• Know and talk about the different factors that support their overall health and wellbeing: regular physical activity; healthy eating; toothbrushing; sensible amounts of 'screen time'; having a good sleep routine; being a safe pedestrian.
	Understanding the World	• Explore the natural world around them. • Describe what they see, hear and feel while they are outside.

		• Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.

Disciplinary Knowledge.

	Key Stage 1	Lower Key Stage 1	Upper Key Stage 2
Plan	Asking simple questions and recognising that they can be answered in different ways. Children can: - explore the world around them, leading them to ask some simple scientific questions about how and why things happen; - begin to recognise ways in which they might answer scientific questions; - ask people questions and use simple secondary sources to find answers.	Asking relevant questions and using different types of scientific enquiries to answer them. Children can: - start to raise their own relevant questions about the world around them in response to a range of scientific experiences; - start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; - recognise when a fair test is necessary; - help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Children can: - with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; - with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; - explore and talk about their ideas, raising different kinds of scientific questions; - ask their own questions about scientific phenomena; - select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; - make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; - plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary.
Do	Observing closely, using simple equipment. Performing simple tests. Identifying and classifying.	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.

	Children can: - observe the natural and humanly-constructed world around them; - observe changes over time; - use simple measurements and equipment; - make careful observations, sometimes using equipment to help them observe carefully; - carry out simple practical tests, using simple equipment; - experience different types of scientific enquiries, including practical activities; - talk about the aim of scientific tests they are working on; - use simple features to compare objects, materials and living things; - decide how to sort and classify objects into simple groups with some help.	Setting up simple practical enquiries, comparative and fair tests. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. - Children can: - make systematic and careful observations; - observe changes over time; - use a range of equipment, including thermometers and data loggers; - ask their own questions about what they observe; - where appropriate, take accurate measurements using standard units using a range of equipment; - set up and carry out simple comparative and fair tests; - talk about criteria for grouping, sorting and classifying; - group and classify things.	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Children can: - choose the most appropriate equipment to make measurements and explain how to use it accurately; - take measurements using a range of scientific equipment with increasing accuracy and precision; - make careful and focused observations; - know the importance of taking repeat readings and take repeat readings where appropriate; - independently group, classify and describe living things and materials; - use and develop keys and other information records to identify, classify and describe living things and materials.
Record	Gathering and recording data to help in answering questions. Children can: - record and communicate findings in a range of ways with support; - sort, group, gather and record data in a variety of ways to help in answering questions, such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables.	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. Children can: - collect data from their own observations and measurements; - present data in a variety of ways to help in answering questions; - use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge;	**Upper KS2 Science National Curriculum** Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Children can: - decide how to record data from a choice of familiar approaches; - record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.

		• record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables	
Review	Using their observations and ideas to suggest answers to questions. Children can: • notice links between cause and effect with support; • begin to notice patterns and relationships with support; • begin to draw simple conclusions; • identify and discuss differences between their results; • use simple and scientific language; • read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; • talk about their findings to a variety of audiences in a variety of ways.	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings. Children can: • draw simple conclusions from their results; • make predictions; • suggest improvements to investigations; • raise further questions which could be investigated; • first talk about, and then go on to write about, what they have found out; • report and present their results and conclusions to others in written and oral forms with increasing confidence; • make links between their own science results and other scientific evidence; • identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; • use straightforward scientific evidence to answer questions or support their findings; • recognise when and how secondary sources might help them to answer questions that cannot be answered through practical	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. Using test results to make predictions to set up further comparative and fair tests. Identifying scientific evidence that has been used to support or refute ideas or arguments. Children can: • notice patterns; • draw conclusions based in their data and observations; • use their scientific knowledge and understanding to explain their findings; • read, spell and pronounce scientific vocabulary correctly; • identify patterns that might be found in the natural environment; • look for different causal relationships in their data; • discuss the degree of trust they can have in a set of results; • independently report and present their conclusions to others in oral and written forms; • use their test results to identify when further tests and observations may be needed; • use test results to make predictions for further tests; • use primary and secondary sources evidence

		investigations.	to justify ideas; - identify evidence that refutes or supports their ideas; - recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; - use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; - talk about how scientific ideas have developed over time

The disciplinary skills will be visited throughout the topics studied within each year.

Substantive Knowledge

	Area of Science Curriculum		
	Cycle A		
Key Stage 1	**Animals including Humans** **Seasonal Change**	**Materials**	**Plants**
	Pupils should be taught to: • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals; • identify and name a variety of common animals that are carnivores, herbivores and omnivores; • 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. **Pupils should be taught to:** • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.	**Everyday Materials** **Pupils should be taught to:** • distinguish between an object and the material from which it is made; • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock; • describe the simple physical properties of a variety of everyday materials; • compare and group together a variety of everyday materials on the basis of their simple physical properties. **Pupils should be taught to:** • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.	**Pupils should be taught to:** • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees; • identify and describe the basic structure of a variety of common flowering plants, including trees. • observe and describe how seeds and bulbs grow into mature plants; • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. **Pupils should be taught to:** • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.
Key Vocabulary	• Names of animal groups: **fish, amphibians, reptiles, birds, mammals.** • Animal diets: **carnivore, herbivore, omnivore.**	• Names of **materials**: wood, plastic, glass, metal, water, rock, paper, cardboard, rubber, fabric. • Properties of materials: **hard, soft, shiny, dull, stretchy**, **rough**, **smooth, bendy, not bendy, transparent, opaque, waterproof, not**	• Names of common plants: **wild plant, garden plant, evergreen** tree, **deciduous** tree, common flowering plant, **weed,** grass.

	• Human and animal body parts: e.g. body, head, neck, arms, elbows, legs, knees, face, ears, eyes, nose, hair, mouth, teeth, hands, feet, tail, wings, feathers, fur, beak, fins, gills. • Human senses: **sight, hearing, touch, smell, taste.** • Exploring senses: loud, quiet, soft, rough. • Other: human, animal, pet. • **Seasons**: **spring, summer, autumn, winter**, seasonal change. • **Weather**: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast. • Measuring weather: temperature, rainfall, wind direction, thermometer, rain gauge. • Day length: night, day, **daylight.**	**waterproof**, **absorbent, not absorbent,** sharp, stiff. Other: **object** • **Seasons**: **spring, summer, autumn, winter**, seasonal change. • **Weather**: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast. • Measuring weather: temperature, rainfall, wind direction, thermometer, rain gauge. • Day length: night, day, **daylight.**	• Name some features of plants: e.g. **flower**, vegetable, **fruit**, berry, **leaf/leaves**, blossom, **petal**, **stem**, trunk, branch, **root**, **seed, bulb,** soil. • Name some common types of plant e.g. sunflower, daffodil. • Growth of plants: **germination**, **shoot, seed dispersal,** grow, food store, life cycle, die, wilt, seedling, sapling. • Needs of plants: **sunlight, nutrition,** light, healthy, space, air. • Name different types of plant: e.g. bean plant, cactus. • Names of different habitats: e.g. rainforest, desert. Previously introduced vocabulary: **water**, **temperature**, warm, hot, cold, habitat • **Seasons**: **spring, summer, autumn, winter**, seasonal change. • **Weather**: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast. • Measuring weather: temperature, rainfall, wind direction, thermometer, rain gauge. • Day length: night, day, **daylight.**
Lower Key Stage 2	**Light** **Forces and Magnets**	**States of Matter**	**Plants** **Living things and their Habitats**
	Pupils should be taught to:	**Pupils should be taught to:** • compare and group materials together, according to whether they are solids, liquids or gases;	**Pupils should be taught to:**

	• recognise that they need light in order to see things and that dark is the absence of light; • notice that light is reflected from surfaces; • recognise that light from the sun can be dangerous and that there are ways to protect their eyes; • recognise that shadows are formed when the light from a light source is blocked by an opaque object; find patterns in the way that the size of shadows change **Pupils should be taught to:** • compare how things move on different surfaces; • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance; • observe how magnets attract or repel each other and attract some materials and not others; • compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials; • describe magnets as having 2 poles; • predict whether 2 magnets will attract or repel each other, depending on which poles are facing.	• 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); • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers; • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant; • investigate the way in which water is transported within plants; • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Pupils should be taught to:** • recognise that living things can be grouped in a variety of ways; • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment; • recognise that environments can change and that this can sometimes pose dangers to living things.
Key Vocabulary	• Light and seeing: **dark,** absence of light, **light source,** illuminate, visible, **shadow, translucent,** energy, block.	• **States of matter: solids, liquids, gases,** particles.	• Process of reproduction: **gestation, asexual reproduction, sexual reproduction,** sperm, egg, cells, clone.

	• **Light sources:** e.g. candle, torch, fire, lantern, lightning. • **Reflective light: reflect, reflection,** surface, **ray**, scatter, reverse, beam, angle, mirror, moon. • Sun safety: dangerous, glare, damage, UV light, UV rating, sunglasses, direct. Previously introduced vocabulary: **opaque, transparent,** sunlight, sun. **Forces and Magnets** • How things move: move, movement, **surface**, distance, strength. • Types of **forces**: push, pull, contact force, non-contact force, **friction**. • **Magnets: magnetic, magnetic field,** magnetic force, bar magnet, horseshoe magnet, ring magnet, magnetic **poles** (north pole, south pole), **attract, repel,** compass. • Magnetic and non-magnetic materials: e.g. iron, nickel, cobalt. Previously introduced vocabulary: metal, names of materials.	• State change: **evaporate, condense, melt, freeze**, heat, cool, melting point, freezing point, boiling point, **water vapour**. • Water cycle: **precipitation**, evaporation, condensation, ground run-off, collection, underground water, bodies of water (sea, river, stream), water droplets, hail. • Other: atmosphere. Previously introduced vocabulary: temperature, rain, cloud, snow, wind, sun, hot, cold, absorb, carbon dioxide	• Changes and **life cycle:** embryo, foetus, uterus, **prenatal, adolescence, puberty, menstruation, adulthood,** menopause, **life expectancy,** old age, hormones, sweat. • Changing body parts: e.g. breasts, penis, larynx, ovaries, genitalia, pubic hair. Previously introduced vocabulary: reproduction, **reproduce,** types of animals and animal groups, **fertilisation**. • **Circulatory system:** circulation, **heart**, pulse, heartbeat, heart rate, lungs, breathing, **blood vessels**, blood, pump, transported, **oxygenated blood, deoxygenated blood,** oxygen, arteries, veins, capillaries, chambers, plasma, platelets, white blood cells, red blood cells. • Lifestyle: **drug, alcohol,** smoking, disease, calorie, energy input, energy output. • Other: water transportation, nutrient transportation, waste products. Previously introduced vocabulary: carbon dioxide.
Upper Key Stage 2	**Earth and Space** **Electricity**	**Light**	**Animals Including Humans**
	Earth and Space **Pupils should be taught to:** • describe the movement of the Earth and other planets relative to the Sun in the solar system;	**Pupils should be taught to:** • recognise that light appears to travel in straight lines;	**Pupils should be taught to:** describe the changes as humans develop to old age **Pupils should be taught to:**

	• describe the movement of the Moon relative to the Earth; • describe the Sun, Earth and Moon as approximately spherical bodies; • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky **Electricity** **Pupils should be taught to:** **Pupils should be taught to:** • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit; • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches; • use recognised symbols when representing a simple circuit in a diagram	• use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye; • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes; • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	• 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	• Solar system: **star, planet.** • Names of planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus. • Shape: **spherical bodies, sphere.** • Movement: **rotate, axis, orbit, satellite.** • Theories: **geocentric model, heliocentric model, astronomer.** • Day length: sunrise, sunset, midday, time zone.	• Reflection: periscope. • Seeing light: **visible spectrum, prism.** • How light travels: light waves, wavelength, straight line, **refraction.** Previously introduced vocabulary: names and properties of materials, absorb.	•

	Previously introduced vocabulary: **Sun, moon, shadow**, day, night, heat, **light**, **reflect** • Flow and measure of electricity: **voltage, amps, resistance, electrons**, volts (V), **current**. • Circuits: **symbol,** circuit diagram, component, function, filament. • Variations: dimmer, brighter, louder, quieter. • Types of electricity: natural electricity, human-made electricity, solar panels, power station. • Other: positive, negative.		

	Area of Science Curriculum		
	Cycle B		
Key Stage 1	**Living things and their Habitats**	**Everyday Materials**	**Animals Including Humans**

	Pupils should be taught to: • explore and compare the differences between things that are living, dead, and things that have never been alive; • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other; • identify and name a variety of plants and animals in their habitats, including microhabitats; 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 **Pupils should be taught to:** • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.	**Pupils should be taught to:** • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses; • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **Pupils should be taught to:** • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.	**Pupils should be taught to:** • notice that animals, including humans, have offspring which grow into adults; • find out about and describe the basic needs of animals, including humans, for survival (water, food and air); describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **Pupils should be taught to:** • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.
Key Vocabulary	• Living or dead: **living, dead, never living,** not living, alive, never been alive, healthy. • **Habitats** including **microhabitats**: **depend,** shelter, safety, **survive**, suited, space, minibeast, air. • **Life processes:** movement, sensitivity, growth, reproduction, nutrition, excretion, respiration. • **Food chains: food sources,** food, producer, consumer, predator, prey. • Names of habitats and microhabitats: e.g. under leaves, woodland, rainforest, sea shore, ocean, urban, local habitat.	• Changing shape: squash, bend, twist, stretch. • **Properties of materials:** e.g. strong, flexible, light, hard-wearing, elastic • Other: **suitability**, recycle, pollution Previously introduced vocabulary: **water**. • **Seasons**: **spring, summer, autumn, winter**, seasonal change.	• Being born and growing: • **Young, offspring, live young**, grow, **develop**, change, hatch, lay, fly, crawl, talk. • Young and adult names: e.g. lamb and sheep, kitten and cat, duckling and duck. • **Life cycle** stages: e.g. baby, toddler, child, teenager, **adult;** frogspawn, tadpole, froglet, frog. • Survival and staying healthy: basic needs, survive, food, air, **exercise, diet, nutrition**, healthy, balanced diet, **hygiene, germs.**

	Previously introduced vocabulary: senses, **carnivore**, **herbivore**, **omnivore**, **seed**, **water**, names of materials. • **Seasons**: **spring, summer, autumn, winter**, seasonal change. • **Weather**: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast. • Measuring weather: temperature, rainfall, wind direction, thermometer, rain gauge. • Day length: night, day, **daylight**.	• **Weather**: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast. • Measuring weather: temperature, rainfall, wind direction, thermometer, rain gauge. • Day length: night, day, **daylight**.	• Food groups: fruit and vegetables, proteins, dairy and alternatives, carbohydrates, oil and spreads, fat, salt, sugar. • **Seasons**: **spring, summer, autumn, winter**, seasonal change. • **Weather**: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast. • Measuring weather: temperature, rainfall, wind direction, thermometer, rain gauge. • Day length: night, day, **daylight**.
Lower Key Stage 2	**Rocks** **Sound**	**Electricity**	**Animals including Humans**
	Pupils should be taught to: • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties; • describe in simple terms how fossils are formed when things that have lived are trapped within rock; • recognise that soils are made from rocks and organic matter **Pupils should be taught to:** • identify how sounds are made, associating some of them with something vibrating; • recognise that vibrations from sounds travel through a medium to the ear;	**Pupils should be taught to:** • identify common appliances that run on electricity; • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers; • identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery; • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit; recognise some common conductors and insulators, and associate metals with being good conductors	**Pupils should be taught to:** • identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat; • identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Pupils should be taught to:** • describe the simple functions of the basic parts of the digestive system in humans; • identify the different types of teeth in humans and their simple functions;

	• find patterns between the pitch of a sound and features of the object that produced it; • find patterns between the volume of a sound and the strength of the vibrations that produced it; • recognise that sounds get fainter as the distance from the sound source increases.		• construct and interpret a variety of food chains, identifying producers, predators and prey.
Key Vocabulary	**Rocks** • Types of rock: **sedimentary rock, igneous rock, metamorphic rock.** • **Properties of rocks: permeable,** semi-permeable, **impermeable,** durable. • Names of rocks: e.g. marble, chalk, granite, sandstone, slate. • Formation of rocks and fossils: natural, human-made, **magma, lava,** molten rock, **sediment, erosion, fossilisation,** layers, bone, fossil. • Soil: sandy, chalky, clay, peaty, loamy, topsoil, subsoil, bedrock, mineral, organic matter, compost. • Other: **palaeontology.** Previously introduced vocabulary: soil, **water**, air. **Sound** • Parts of the **ear**: **eardrum.** • Making sound: **vibration,** vocal cords, **particles.** • Measuring sound: **pitch**, **volume, amplitude, sound wave,** quiet, loud, high, low, travel, **distance.** • Other: **soundproof, absorb sound.**	• **Electricity:** mains-powered, • battery-powered, **mains electricity,** plug, **appliances**, devices. • Circuits: **circuit,** simple series circuit, complete circuit, incomplete circuit. • Circuit parts: bulb, cell, wire, buzzer, switch, motor, **battery.** • Materials: **electrical conductor, electrical insulator.** • Other: safety. Previously introduced vocabulary: names of materials.	• Food groups and **nutrients**: fibre, fats **(saturated and unsaturated**), vitamins, minerals. • Skeletons and muscles: skeleton, **muscles, tendons, joints,** protection, support, organs, voluntary muscles, involuntary muscles, biceps, triceps, contract, relax, bone, cartilage, shell, **vertebrate, invertebrate,** endoskeleton, exoskeleton, hydrostatic skeleton. • Names of human bones: e.g. skull, spine, backbone, vertebral column, ribcage, pelvis, clavicle, scapula, humerus, ulna, pelvis, radius, femur, tibia, fibula. • Other: **energy.** Previously introduced vocabulary: movement. • Digestive system: **digest**, digestion, tongue, teeth, saliva, salivary glands, **oesophagus, stomach,** liver, pancreas, gall bladder, **small intestine,** duodenum, **large intestine, rectum,** anus, faeces, organ. • Types of teeth and dental care: **molar**, **premolar**, **incisor**, **canine**, wisdom teeth, tooth decay, plaque, enamel, baby (milk) teeth. • Food chains and animal diets: decomposer, food web.

			Previously introduced vocabulary: **producer,** consumer, **prey, predator,** excretion, habitat.
Upper Key Stage 2	**Forces** **Properties and Changes of Materials**	**Evolution and Inheritance**	**Animals including Humans**
	Pupils should be taught to: • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird; • describe the life process of reproduction in some plants and animals. • **Pupils should be taught to:** • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals; give reasons for classifying plants and animals based on specific characteristics • 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.	**Pupils should be taught to:** • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago; • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents; • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	**Forces** **Pupils should be taught to:** • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object; • identify the effects of air resistance, water resistance and friction, that act between moving surfaces; recognise that some mechanisms including levers, pulleys and gears allow **Properties and Changes of Materials** **Pupils should be taught to:** • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets; • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution; • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating; • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic;

			• demonstrate that dissolving, mixing and changes of state are reversible changes;
Key Vocabulary	• Water transportation: transport, **evaporation, evaporate, nutrients,** absorb, anchor. • Life cycle of flowering plants: **pollination** (insect/wind), pollen, nectar, pollinator, seed formation, **seed dispersal** (animal/wind/water), reproduce, **fertilisation,** fertilise, **stamen,** anther, filament, **carpel (pistil),** stigma, style, ovary, ovule, **sepal**, carbon dioxide. • Living things: **organisms, specimen,** species. • Grouping living things: **classification,** classification keys, classify, **characteristics**. • Names of invertebrate animals: snails and slugs, worms, spiders, insects. • Invertebrate body parts: e.g. wing case, abdomen, thorax, antenna, segments, mandible, proboscis, prolegs. • Environmental changes: **environment,** environmental dangers, adapt, natural changes, climate change, deforestation, pollution, urbanisation, invasive species, **endangered species, extinct.** Previously introduced vocabulary: carbon dioxide, **fish, bird, mammal, amphibian, reptile,** skeleton, bone, **vertebrate, invertebrate,** backbone, names for animal body parts, names of common plants, photosynthesis. • **Reproduction**: **asexual reproduction, sexual reproduction**, **gestation, metamorphosis,** gametes, tuber, runners/side branches, plantlet,	• **Evolution** and **inheritance:** evolve, **adaptation,** inherit, **natural selection, adaptive traits, inherited traits,** mutations, theory of evolution, ancestors, biological parent, chromosomes, genes, Charles Darwin. • Other: selective breeding, artificial selection, breed, cross breeding, genetically modified food, cloning, DNA. Previously introduced vocabulary: classification, **offspring, characteristics, habitat, environment,** adapt, **variations**, human, **fossil,** suited, cells, names of different habitats, names of animals and their body parts, species, **sedimentary rock**, lava, **igneous rock**, **metamorphic rock**, **magma**, heat, **fossilisation**.	Previously introduced vocabulary: life cycle. • Types of forces: **air resistance, water resistance, buoyancy, upthrust,** Earth's **gravitational pull, gravity**, opposing forces, driving force. • **Mechanisms:** levers, pulleys, gears/cogs. • Measurements: **weight, mass,** kilograms (kg), Newtons (N), scales, speed, fast, slow. • Other: **streamlined**, Earth. Previously introduced vocabulary: air, heat, moon • Properties of **materials**: thermal **conductor/insulator,** magnetism, electrical resistance, **transparency**. • Mixtures and solutions: dissolving, substance, soluble, insoluble. • Changes of materials: reversible change, physical change, irreversible change, chemical change, burning, new material, product. • Separating: sieving, filtering, magnetic attraction. Previously introduced vocabulary: electrical **conductor/insulator,** bulb, **translucent**.

	cuttings, embryo, adolescent, penis, vagina, egg, pregnancy, gestation. Previously introduced vocabulary: **life cycle, pollination,** offspring, **fertilise,** fertilisation, sepal, filament, anther, stamen, pollen, petal, stigma, style, ovary, carpel, ovule, stem, bulb, roots, mammal, adult, baby, sperm, cells, live young. • Classifying: Carl Linnaeus, Linnaean system, flowering and non-flowering plants, variation. • **Microorganisms**: **bacteria,** single-celled, microbes, microscopic, virus, fungi, fungus, mould, antibiotic, yeast, ferment, **microscope**, decompose.		