Loxwood Primary School
Science

Intent:

At Loxwood Primary School, we understand the importance of both knowledge and understanding within Science and working scientifically, to prepare children for the wider world and their future education. Every child is encouraged to be curious, ask questions and to test their ideas.

Our aim is for every child, to reach their full potential by:

- Being encouraged to be inquisitive about the world around them, nurturing their innate curiosity and enabling them to increase their knowledge and understanding of our world.
- Developing scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics as set out in the National Curriculum.
- Being introduced to subject specific scientific vocabulary to enable them to explain their thinking and understanding and ask questions.
- Developing an understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- Learning about and be inspired by a wide range of scientists from diverse backgrounds, genders, ethnicities and disciplines in order to see themselves as our scientists of the future.
- Being equipped with the scientific skills required to understand the uses and implications of science, today and for the future.

In Science, we incorporate our core values (**Resilience, Collaboration, Curiosity, Creativity and Kindness**) to ensure that our children develop as **life-long learners and responsible citizens**. Through Quality First Teaching and having high expectations, we ensure all children (including disadvantaged and SEND) are accessing the curriculum by constantly reviewing and adapting teaching.

Implementation:

We have a coherent and sequenced curriculum building progression of knowledge and skills every year. EYFS have their own topic cycle but work alongside Key Stage 1. Year 1 and 2 follow broadly similar themes in Science throughout the year, building on knowledge and skills learned in the previous year. Key Stage 2 work in pairs –Year 3 and Year 4 and then Year 5 and Year 6 and follow a two-year topic cycle. These year groups plan together weekly. Children in EYFS are concerned with learning about the world around them and what they can see and experience in their immediate environment. Children's learning comes from their natural interest and curiosity and is developed by the curriculum. They are introduced to simple equipment such as magnifying glasses and learn how to use this safely. They begin to explore the world beyond their immediate environment through play, stories and role play. Throughout Key Stages 1 and 2 learning in Science is often linked to learning in other curriculum subjects, allowing children to make connections and see applications for scientific knowledge in the real world. 'Working Scientifically' is woven throughout each area of Science Learning across the school year, so that children develop this disciplinary knowledge alongside the substantive knowledge in each year group. Through revisiting and consolidating their knowledge, our curriculum helps children build on prior understanding alongside introducing new skills and challenge. Across all year groups children are given the opportunity to work practically, testing things out for themselves and recording their observations in different ways.

Impact:

Children who feel confident in their science knowledge and enquiry skills will be excited about science. They will show that they are actively curious to learn more and will see the relevance of what they learn in science lessons to real-life situations and also the importance of science in the real world. Our children will see themselves as future scientists; they will ask questions and be able to suggest ways in which to answer them, be observant and inquisitive, they will be able to explain their knowledge and ideas to others in effective ways. Our children will develop a wide scientific vocabulary, enabling them to understand and discuss their own scientific learning and that of others.

Science Whole School Topic Overview

	Cycle A (2022-2023)						Cycle B (2023-2024)					
	Autumn		**Spring**		**Summer**		**Autumn**		**Spring**		**Summer**	
EYFS	This is Me!	Night and Day	Traditional tales	People who help us	Growing	Moving on, journeys and adventures	This is Me!	Night and Day	Traditional tales	People who help us	Growing	Moving on, journeys and adventures
Year 1	Everyday Materials		Seasonal Changes Animals including Humans		Seasonal Changes Plants		Everyday Materials		Seasonal Changes Animals including Humans		Seasonal Changes Plants	
Year 2	Everyday Materials		Living things and their Habitats		Animals including Humans Plants		Everyday Materials		Living things and their Habitats		Animals including Humans Plants	
Year 3 & 4	Skeletons, Muscles & Nutrition. Digestive System & Teeth		States of Matter Water Cycle Sound		Living Things & Habitats Food Chains		Rocks Light & Shadow		Electricity Forces & magnets		Plants	
Year 5 & 6	Electricity & Light		Animals including Humans		Evolution and Inheritance		Earth & Space		Properties and Changes of Materials		Living Things and Their Habitats	

Progression in Science:

S	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including humans Knowledge and understanding Progression (Substantive Knowledge)	Identify some of the animals that they find in the school grounds and talk about how they are different. Name and describe different animals using simple vocabulary. 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 (PSED) *Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. (ELG PSED)*	**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:** • 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:** • 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; • construct and interpret a variety of food chains, identifying producers, predators and prey.	**Pupils should be taught to:** • describe the changes as humans develop to old age.	**Pupils should be taught to:** • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood; • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function; • describe the ways in which nutrients and water are transported within animals, including humans.
Vocabulary Progression	• Names of familiar animals: eg cow, horse, ant • Simple human and animal body parts.	• Names of animal groups: **fish, amphibians, reptiles, birds, mammals.** • Animal diets: **carnivore, herbivore, omnivore.** • 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.	• 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.	• 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,**	• 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,	• Process of reproduction: **gestation, asexual reproduction, sexual reproduction,** sperm, egg, cells, clone. • 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,	• **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,

		• Human senses: **sight, hearing, touch, smell, taste.** • Exploring senses: loud, quiet, soft, rough. • Other: human, animal, pet.	• Survival and staying healthy: basic needs, survive, food, air, **exercise, diet, nutrition**, healthy, balanced diet, **hygiene, germs.** • Food groups: fruit and vegetables, proteins, dairy and alternatives, carbohydrates, oil and spreads, fat, salt, sugar. Previously introduced vocabulary: **water**.	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.	enamel, baby (milk) teeth. • Food chains and animal diets: decomposer, food web. Previously introduced vocabulary: **producer,** consumer**, prey, predator,** excretion**,** habitat.	larynx, ovaries, genitalia, pubic hair. Previously introduced vocabulary: reproduction, **reproduce,** types of animals and animal groups, **fertilisation.**	calorie, energy input, energy output. • Other: water transportation, nutrient transportation, waste products. Previously introduced vocabulary: carbon dioxide.
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Plants Knowledge and understanding Progression (Substantive Knowledge)	Describe what they see, hear and feel while they are outside. (UTW) Children will identify some common plants in the school grounds and talk about how they are different. Children will learn that some plants are safe to eat and some plants are unsafe to eat.	**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.	**Pupils should be taught to:** • observe and describe how seeds and bulbs grow into mature plants; • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	**Pupils should be taught to:** • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers; • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant; • investigate the way in which water is transported within plants; • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	•	•	•
Vocabulary Progression	Names of some common plants found in the school	• Names of common plants: **wild plant, garden plant, evergreen**	• Growth of plants: **germination**, **shoot, seed dispersal,** grow,	• Water transportation: transport, **evaporation,**			.

	grounds: eg daisy, buttercup, dandelion etc Name some basic features of plants: e.g. leaf, flower, stem.	tree, **deciduous** tree, common flowering plant, **weed,** grass. • 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.	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.	**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. Previously introduced vocabulary: life cycle**.**			
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Living Things and their Habitats Knowledge and understanding Progression (Substantive Knowledge)	Describe what they see, hear and feel while they are outside. (UTW) Recognise some environments that are different to the one in which they live (UTW) Children will explore and identifying different habitats in the school grounds. Children will identify some of the animals that they find and talk about where they live. *Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. (ELG UTW)*		**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		**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.	**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.

			different sources of food.				
Vocabulary Progression	• Habitat names: eg compost heap, field, woodland, flower bed. • Baby, grow, parent		• 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. Previously introduced vocabulary: senses, **carnivore**, **herbivore**, **omnivore**, **seed**, **water**, names of materials.		• 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, 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.

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Evolution and inheritance	(See Living things and their environment)	(See Living things and their environment)	(See Living things and their environment)	(See Living things and their environment)	(See Living things and their environment)	(See Living things and their environment)	**Pupils should be taught to:** • recognise that living things have changed over time and that

Knowledge and understanding Progression (Substantive Knowledge)							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.
Vocabulary Progression	(See Living things and their environment)	(See Living things and their environment)	(See Living things and their environment)	(See Living things and their environment)	(See Living things and their environment)	(See Living things and their environment)	• **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**.
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Seasonal Change Knowledge and understanding Progression (Substantive Knowledge)	Understand the effect of changing seasons on the natural world around them. (UTW) Identify and describe different types of weather when outside. Identify and describe night and day and talk about how they are different. *Understand some important processes and changes in the natural world around them, including the seasons. (ELG UTW)*	**Pupils should be taught to:** • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.					
Vocabulary Progression	**Seasons:** names of the days of the week, months of the year and seasons. **Weather:** simple weather vocabulary to describe what they can see and feel when outside.	• **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.**					
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Forces Knowledge and understanding	(Link to materials) Children will experience a range of different equipment involving forces, such as wheeled vehicles, magnets etc.	(Link to materials)	(Link to materials)	Forces and Magnets **Pupils should be taught to:** • compare how things move on different surfaces; • notice that some forces need contact between 2		Forces **Pupils should be taught to:** • explain that unsupported objects fall towards the Earth because of the force of	

Progression (Substantive Knowledge)	They will know that if they act upon an object something might happen, eg pushing a car down a ramp.			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.		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.	
Vocabulary Progression	(Link to materials)	(Link to materials)	(Link to materials)	• 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.		• 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.	
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Sound	(Link to Animals and Humans)	(Link to Animals and Humans)			**Pupils should be taught to:**		

Knowledge and understanding Progression (Substantive Knowledge)					• identify how sounds are made, associating some of them with something vibrating; • recognise that vibrations from sounds travel through a medium to the ear; • find patterns between the pitch of a sound and features of the object that produced it; • find patterns between the volume of a sound and the strength of the vibrations that produced it; • recognise that sounds get fainter as the distance from the sound source increases.		
Vocabulary Progression	(Link to Animals and Humans)	(Link to Animals and Humans)			• 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.**		

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Earth and Space Knowledge and understanding	(Link to seasonal change)	(Link to seasonal change)				**Pupils should be taught to:** • describe the movement of the Earth and other planets relative to the Sun in the solar system;	

Progression (Substantive Knowledge)						• 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.	
Vocabulary Progression	(Link to seasonal change)	(Link to seasonal change)				• 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. Previously introduced vocabulary: **Sun, moon, shadow**, day, night, heat, **light**, **reflect**.	

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electricity	(Link to materials)	(Link to materials)	(Link to materials)	(Link to materials)	**Pupils should be taught to:**		**Pupils should be taught to:** • associate the brightness of a lamp or the volume

Knowledge and understanding Progression (Substantive Knowledge)					• 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.		• 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.
Vocabulary Progression	(Link to materials)	(Link to materials)	(Link to materials)	(Link to materials)	• **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.		• 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.

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Materials Knowledge and understanding Progression (Substantive Knowledge)	Name and talk about some everyday objects and identify some by the material they are made from. Use simple vocabulary to describe how materials feel and talk about similarities and differences. *Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. (ELG UTW)*	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.	Use of Everyday Materials **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.	Rocks **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.	States of Matter **Pupils should be taught to:** • compare and group materials together, according to whether they are solids, liquids or gases; • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C); • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	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; • 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.	

Vocabulary Progression	Names of common **materials**: eg wood, paper, metal, plastic. Properties of materials: soft, hard, fluffy, smooth, spiky, furry etc.	• 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 waterproof**, **absorbent, not absorbent,** sharp, stiff. • Other: **object.**	• Changing shape: squash, bend, twist, stretch. • **Properties** of **materials:** e.g. strong, flexible, light, hard-wearing, elastic. • Other: **suitability**, recycle, pollution.	• 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.	• **States of matter: solids, liquids, gases,** particles. • 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	• 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**.	
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Asking questions and recognising that they can be answered in different ways Working Scientifically Progression (Disciplinary Knowledge)	Children ask questions about what they see around them, eg how something works. *Make comments about what they have heard and ask questions to clarify their understanding (ELG C&L)*	**Asking simple questions and recognising that they can be answered in different ways** •While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions.	**Asking simple questions and recognising that they can be answered in different ways** •The children answer questions developed with the teacher often through a scenario. •The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered.	**Asking relevant questions and using different types of scientific enquiries to answer them** •The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. •The children answer questions posed by the teacher.	**Asking relevant questions and using different types of scientific enquiries to answer them** •Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** •Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** •Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.

Making observations and taking measurements Working Scientifically Progression (Disciplinary Knowledge)	Describe what they see, hear and feel while they are outside. (UTW) Children are keen to explore their surroundings and use different equipment such as magnifying glasses. They talk about the things that they notice and can make simple comparisons. Describe events in some detail. (C&L) *Explore the natural world around them, making observations and drawing pictures of animals and plants. (ELG UTW)*	**Observing closely, using simple equipment** •Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations.	**Observing closely, using simple equipment** •They begin to take measurements, initially by comparisons, then using non-standard units.	**Setting up simple practical enquiries, comparative and fair tests** •The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher.	**Setting up simple practical enquiries, comparative and fair tests** •They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.	**Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate** •The children select measuring equipment to give the most precise results eg. ruler, tape measure or trundle wheel, force meter with a suitable scale.	**Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate** •During an enquiry, they make decisions eg. whether they need to take repeat readings (fair testing) increase the sample size (pattern seeking) adjust the observation period and frequency (observing over time) or check further secondary sources (researching) in order to get accurate data (closer to the true value).
Engaging in practical enquiry to answer questions Working Scientifically Progression (Disciplinary Knowledge)	They use simple equipment provided eg ramps, magnets etc. Children sort objects using simple criteria.	**Performing simple tests** •The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. **Identifying and classifying** •Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting.	**Performing simple tests** They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. **Identifying and classifying** •They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.	**Setting up simple practical enquiries, comparative and fair tests** •The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher.	**Setting up simple practical enquiries, comparative and fair tests** •They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** •The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables.	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.
Recording and presenting evidence Working Scientifically	Children make simple drawings and models and talk about what they have found out using simple language.	**Gathering and recording data to help in answering questions** •The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing.	**Gathering and recording data to help in answering questions** They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs.	**Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled**	**Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled**	**Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**	**Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**

Progression (Disciplinary Knowledge)	*Explore the natural world around them, making observations and drawing pictures of animals and plants. (ELG UTW)*	•They classify using simple prepared tables and sorting rings.		**diagrams, keys, bar charts, and tables** •The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams.	**diagrams, keys, bar charts, and tables** •Children are supported to present the same data in different ways in order to help with answering the question.	•The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.	•Children present the same data in different ways in order to help with answering the question.
Answering questions and concluding Working Scientifically Progression (Disciplinary Knowledge)	Explore the natural world around them. (UTW) Children talk about what they notice and relate this to their experience of the world around them. Use new vocabulary in different contexts. (C&L)	**Using their observations and ideas to suggest answers to questions** •Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources.	**Using their observations and ideas to suggest answers to questions** •The children recognise 'biggest and smallest', 'best and worst' etc. from their data	**Using straightforward scientific evidence to answer questions or to support their findings**. •With support children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. **Identifying differences, similarities or changes related to simple scientific ideas and processes** •With support children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships. **Using results to draw simple conclusions, make**	**Using straightforward scientific evidence to answer questions or to support their findings**. Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. **Identifying differences, similarities or changes related to simple scientific ideas and processes** •Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.	**Identifying scientific evidence that has been used to support or refute ideas or arguments** •Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. **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** •With support in their conclusions, children	**Identifying scientific evidence that has been used to support or refute ideas or arguments** •They talk about how their scientific ideas change due to new evidence that they have gathered. •They talk about how new discoveries change scientific understanding. **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**

				predictions for new values, suggest improvements and raise further questions •With support they draw conclusions based on their evidence and current subject knowledge.	**Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** They draw conclusions based on their evidence and current subject knowledge.	identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.	•In their conclusions, children identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.
Evaluating and raising further questions and predictions Working Scientifically Progression (Disciplinary Knowledge)	Children talk about what might happen when they perform an action, eg pushing a car down a ramp or dropping a toy into the water tray. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. (C&L)	**Talk about what they think will happen** (Not Statutory)	**Talk about what they think will happen** (Not Statutory)	**Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** •They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.	**Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** •Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. •Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.	**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** •They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. •They identify any limitations that reduce the trust they have in their data.	**Using test results to make predictions to set up further comparative and fair tests** •Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.
Communicating their findings Working Scientifically Progression (Disciplinary Knowledge)	Children talk about what they have noticed and draw simple pictures. *Explore the natural world around them, making observations and drawing pictures of animals and plants. (ELG UTW)*	**Talk about what they have found out** (Not Statutory)	**Talk about what they have found out** (Not Statutory)	**Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions** •With support they communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.	**Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions** They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.	**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** •With support they communicate their findings to an audience using relevant scientific language and illustrations.	**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** •They communicate their findings to an audience using relevant scientific language and illustrations.