



Science Progression at NLAS

Intent

Our aim is for all pupils to be knowledgeable, expressive and inspired:

In science this means children are engaged and inspired by a well-designed sequential curriculum complimented by a wide range of enrichment opportunities. Science is highly valued as part of our rich curriculum and supports children to acquire the transferrable skills, knowledge and cultural capital they need to succeed in life.

Our Four Curriculum Drivers underpin our approach to learning across all subjects at NLAS.

Global Citizens



Healthy Body, Healthy Mind



Adventure & Exploration



Aspirations



Our intent is that our children develop the scientific knowledge and conceptual understanding they need in order to make sense of the world, through the specific disciplines of biology, chemistry and physics. They develop understanding of how to work scientifically through different types of scientific enquiries (comparative and fair testing; pattern seeking; identifying, classifying and grouping; observing over time; research using secondary sources) that help them to answer specific questions about the world around them.

Children acquire the scientific knowledge required to understand the uses and implications of science, today and in the future. Through the teaching of specific science vocabulary and opportunities to discuss their learning, children develop their ability to think critically, evaluate and understand the world. Children are given sentence stems within which they can frame their ideas and communicate clearly and accurately.

The discoveries, innovations and significant scientists introduced reflect the diversity of our society, enabling pupils to see themselves and others from different cultures within the world of science. This supports the children's belief that they too can be successful scientists. The focus on having



a growth mind-set is essential in the teaching of science, empowering children with the confidence to have a go, to learn from mistakes and to keep trying and improving. This is true of many significant scientists.

Children explore the purposes of science within a context as well as its meaning within their own life and future e.g. exploring the science of climate change or that just because science now enables us to do something, does that mean we should. An appreciation and understanding of how science influences all of our daily lives is essential to the children feeling empowered to make a positive difference to society.

All children, including those who have SEND or are disadvantaged are supported to fully access our curriculum. This may include additional adult support or the use of visuals, structured sentence stems, resources, etc. which acts as a scaffold for children's learning.

Implementation

The Science scheme of work, developed by staff across all key stages, lays out the sequential steps to be taught so that new knowledge and skills build on what has been taught before and pupils can work towards clearly defined high quality outcomes.

Significant scientists, links to key texts (both fiction and non-fiction) and possible trips/workshops are outlined to ensure development of the children's cultural capital.

Science is taught in a variety of ways depending on what is best for purpose. Where possible, meaningful links are made between science and other areas of the curriculum as part of topic learning. Science is taught in units, with lessons sometimes blocked to allow immersion in the process e.g. to complete a full investigation.

Each key strand of science across the three disciplines of biology (plants; animals including humans; living things and their habitats; evolution and inheritance), chemistry (everyday materials; uses of everyday materials; rocks; states of matter; properties and changes of materials) and physics (seasonal changes; Earth and space; light; sound; forces and magnets; electricity) is covered and revisited in line with the National Curriculum so that pupils retain and build upon prior learning.

Long term memory of key science knowledge objectives is supported by this repetition, as well as interleaving activities such as concept cartoons and mini quizzes.

Specific investigations are plotted for each year group, covering all age/phase appropriate enquiry types (comparative and fair testing; pattern seeking; identifying, classifying and grouping; observing over time; research using secondary sources). Plotting specific investigations across each year group ensures that a child will experience the whole range of enquiry types on their learning journey through the school.

National curriculum working scientifically objectives have been distilled into ten child friendly science skills - Asking scientific questions; Planning an enquiry; Observing closely; Taking measurements; Gathering and recording results; Presenting results; Interpreting results; Drawing conclusions (KS2 only); Making predictions (KS2 only); and Evaluating an enquiry (KS2 only). These are displayed in each classroom in order to ensure continuity across the school. Children use these to help them understand key investigation skills.



Sentence stems and the investigation frame are used to support children's understanding of enquiry skills. E.g. stems to support interpretation of results by giving the frame into which the variable and measurable are inserted. The thicker the string the lower the pitch. Using frames supports all children, especially those with SEND to access the science curriculum

The science lead supports teachers and monitors standards by reviewing planning of units, teaching model lessons, team teaching, talking to children with their science learning and observing lessons.

Impact

Children at NLAS have retained key science knowledge.

Children can accurately use specific science vocabulary to explain their ideas and discuss their learning.

Children are interested in the world around them and have a set of key skills which they can use to investigate it.

Children enjoy learning in science and value the subject. They understand its relevance and importance in a real world context and see themselves as scientists not only in school, but in the future.



Whole School Science NC Overview by Year Group

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	<p>Understanding the World Around Us Explore the natural world around them, making observations and drawing pictures of animals and plants 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 Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</p> <p>Communication and Language Make comments about what they have heard and ask questions to clarify their understanding</p> <p>Personal, Social & Emotional Development Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices</p> <p>Understanding the World Explore the natural world around them, making observations and drawing pictures of animals and plants 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 Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</p>					
Year 1	<p>Animals Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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); <p>Seasonal change Pupils should be taught to:</p> <ul style="list-style-type: none"> • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies. 	<p>Everyday Materials Topic Link Great Fire of London Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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; 	<p>Animals Including Humans identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>Everyday Materials • compare and group together a variety of everyday materials on the basis of their simple physical properties.</p> <p>Seasonal change Pupils should be taught to:</p> <ul style="list-style-type: none"> • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies. 	<p>Plants Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 	<p>Plants</p> <p>Seasonal change Pupils should be taught to:</p> <ul style="list-style-type: none"> • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2	<p>Animals including Humans</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Materials and their properties</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 		<p>Plants</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Living things and their habitats</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	
Year 3	<p>Light</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Animals including Humans</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Rocks</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Forces and Magnets</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Plants</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4	<p>Electricity</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 		<p>Animals including Humans</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 	<p>Living Things and their Habitats</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 	<p>Sound</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 	<p>Materials (States of Matter)</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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.



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5	Material Properties Pupils should be taught to: <ul style="list-style-type: none"> • 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; • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic; 	Material: Reversible & irreversible changes <ul style="list-style-type: none"> • 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; • 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. 	Earth and Space Pupils should be taught to: <ul style="list-style-type: none"> • describe the movement of the Earth and other planets relative to the sun in the solar system; • 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. 	Forces Pupils should be taught to: <ul style="list-style-type: none"> • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object; • identify the effects of air resistance, water resistance and friction, that act between moving surfaces; • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. 	Living Things & Their habitats Pupils should be taught to: <ul style="list-style-type: none"> • 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. 	Animals including Humans Pupils should be taught to: <ul style="list-style-type: none"> • describe the changes as humans develop to old age.
Year 6	Evolution & Inheritance Pupils should be taught to: <ul style="list-style-type: none"> • 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. 	Light Pupils should be taught to: <ul style="list-style-type: none"> • recognise that light appears to travel in straight lines; • 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. 	Animals including Humans Pupils should be taught to: <ul style="list-style-type: none"> • 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. 	Living Things and their Environment Pupils should be taught to: <ul style="list-style-type: none"> • 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. 	Electricity Pupils should be taught to: <ul style="list-style-type: none"> • 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. 	Relationship & Sex Education



Whole School Progression of knowledge and vocabulary by Strand

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including Humans	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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.
	<ul style="list-style-type: none"> <u>Names of animal groups:</u> fish, amphibians, reptiles, birds, mammals. <u>Animal diets:</u> carnivore, herbivore, omnivore. <u>Human and animal body parts:</u> 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. <u>Human senses:</u> sight, hearing, touch, smell, taste. <u>Exploring senses:</u> loud, quiet, soft, rough. <u>Other:</u> human, animal, pet. 	<ul style="list-style-type: none"> <u>Being born and growing:</u> Young, offspring, live young, grow, develop, change, hatch, lay, fly, crawl, talk. <u>Young and adult names:</u> e.g. lamb and sheep, kitten and cat, duckling and duck. <u>Life cycle stages:</u> e.g. baby, toddler, child, teenager, adult; frogspawn, tadpole, froglet, frog. <u>Survival and staying healthy:</u> basic needs, survive, food, air, exercise, diet, nutrition, healthy, balanced diet, hygiene, germs. <u>Food groups:</u> fruit and vegetables, proteins, dairy and alternatives, carbohydrates, oil and spreads, fat, salt, sugar. <p>Previously introduced vocabulary: water.</p>	<ul style="list-style-type: none"> <u>Food groups and nutrients:</u> fibre, fats (saturated and unsaturated), vitamins, minerals. <u>Skeletons and muscles:</u> skeleton, muscles, tendons, joints, protection, support, organs, voluntary muscles, involuntary muscles, biceps, triceps, contract, relax, bone, cartilage, shell, vertebrate, invertebrate, endoskeleton, exoskeleton, hydrostatic skeleton. <u>Names of human bones:</u> e.g. skull, spine, backbone, vertebral column, ribcage, pelvis, clavicle, scapula, humerus, ulna, pelvis, radius, femur, tibia, fibula. Other: energy. <p>Previously introduced vocabulary: movement.</p>	<ul style="list-style-type: none"> <u>Digestive system:</u> digest, digestion, tongue, teeth, saliva, salivary glands, oesophagus, stomach, liver, pancreas, gall bladder, small intestine, duodenum, large intestine, rectum, anus, faeces, organ. <u>Types of teeth and dental care:</u> molar, premolar, incisor, canine, wisdom teeth, tooth decay, plaque, enamel, baby (milk) teeth. <u>Food chains and animal diets:</u> decomposer, food web. <p>Previously introduced vocabulary: producer, consumer, prey, predator, excretion, habitat.</p>	<ul style="list-style-type: none"> <u>Process of reproduction:</u> gestation, asexual reproduction, sexual reproduction, sperm, egg, cells, clone. <u>Changes and life cycle:</u> embryo, foetus, uterus, prenatal, adolescence, puberty, menstruation, adulthood, menopause, life expectancy, old age, hormones, sweat. <u>Changing body parts:</u> e.g. breasts, penis, larynx, ovaries, genitalia, pubic hair. <p>Previously introduced vocabulary: reproduction, reproduce, types of animals and animal groups, fertilisation.</p>	<ul style="list-style-type: none"> <u>Circulatory system:</u> 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. <u>Lifestyle:</u> drug, alcohol, smoking, disease, calorie, energy input, energy output. <u>Other:</u> water transportation, nutrient transportation, waste products. <p>Previously introduced vocabulary: carbon dioxide.</p>



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 			
	<ul style="list-style-type: none"> <u>Names of common plants:</u> wild plant, garden plant, evergreen tree, deciduous tree, common flowering plant, weed, grass. <u>Name some features of plants:</u> e.g. flower, vegetable, fruit, berry, leaf/leaves, blossom, petal, stem, trunk, branch, root, seed, bulb, soil. <u>Name some common types of plant</u> e.g. sunflower, daffodil. 	<ul style="list-style-type: none"> <u>Growth of plants:</u> germination, shoot, seed dispersal, grow, food store, life cycle, die, wilt, seedling, sapling. <u>Needs of plants:</u> sunlight, nutrition, light, healthy, space, air. <u>Name different types of plant:</u> e.g. bean plant, cactus. <u>Names of different habitats:</u> e.g. rainforest, desert. <p>Previously introduced vocabulary: water, temperature, warm, hot, cold, habitat.</p>	<ul style="list-style-type: none"> <u>Water transportation:</u> transport, evaporation, evaporate, nutrients, absorb, anchor. <u>Life cycle of flowering plants:</u> 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. <p>Previously introduced vocabulary: life cycle.</p>			



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Living Things and Their Habitats		<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 		<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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.
		<ul style="list-style-type: none"> • <u>Living or dead</u>: living, dead, never living, not living, alive, never been alive, healthy. • <u>Habitats including microhabitats</u>: depend, shelter, safety, survive, suited, space, minibeast, air. • <u>Life processes</u>: movement, sensitivity, growth, reproduction, nutrition, excretion, respiration. • <u>Food chains</u>: food sources, food, producer, consumer, predator, prey. • <u>Names of habitats and microhabitats</u>: e.g. under leaves, woodland, rainforest, sea shore, ocean, urban, local habitat. <p>Previously introduced vocabulary: senses, carnivore, herbivore, omnivore, seed, water, names of materials.</p>		<ul style="list-style-type: none"> • <u>Living things</u>: organisms, specimen, species. • <u>Grouping living things</u>: classification, classification keys, classify, characteristics. • <u>Names of invertebrate animals</u>: snails and slugs, worms, spiders, insects. • <u>Invertebrate body parts</u>: e.g. wing case, abdomen, thorax, antenna, segments, mandible, proboscis, prolegs. • <u>Environmental changes</u>: environment, environmental dangers, adapt, natural changes, climate change, deforestation, pollution, urbanisation, invasive species, endangered species, extinct. <p>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.</p>	<ul style="list-style-type: none"> • <u>Reproduction</u>: asexual reproduction, sexual reproduction, gestation, metamorphosis, gametes, tuber, runners/side branches, plantlet, cuttings, embryo, adolescent, penis, vagina, egg, pregnancy, gestation. <p>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.</p>	<ul style="list-style-type: none"> • <u>Classifying</u>: Carl Linnaeus, Linnaean system, flowering and non-flowering plants, variation. • <u>Microorganisms</u>: bacteria, single-celled, microbes, microscopic, virus, fungi, fungus, mould, antibiotic, yeast, ferment, microscope, decompose.



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Evolution & Inheritance						<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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.
						<ul style="list-style-type: none"> • <u>Evolution and inheritance</u>: evolve, adaptation, inherit, natural selection, adaptive traits, inherited traits, mutations, theory of evolution, ancestors, biological parent, chromosomes, genes, Charles Darwin. • <u>Other</u>: selective breeding, artificial selection, breed, cross breeding, genetically modified food, cloning, DNA. <p>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.</p>



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasonal Changes	<p>Pupils should be taught to:</p> <ul style="list-style-type: none">• observe changes across the 4 seasons;• observe and describe weather associated with the seasons and how day length varies.					
	<ul style="list-style-type: none">• <u>Seasons</u>: spring, summer, autumn, winter, seasonal change.• <u>Weather</u>: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast.• <u>Measuring weather</u>: temperature, rainfall, wind direction, thermometer, rain gauge.• <u>Day length</u>: night, day, daylight.					



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Forces			<p>Forces and Magnets</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 		<p>Forces</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object; • identify the effects of air resistance, water resistance and friction, that act between moving surfaces; • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. 	
			<ul style="list-style-type: none"> • <u>How things move</u>: move, movement, surface, distance, strength. • <u>Types of forces</u>: push, pull, contact force, non-contact force, friction. • <u>Magnets</u>: magnetic, magnetic field, magnetic force, bar magnet, horseshoe magnet, ring magnet, magnetic poles (north pole, south pole), attract, repel, compass. • <u>Magnetic and non-magnetic materials</u>: e.g. iron, nickel, cobalt. <p>Previously introduced vocabulary: metal, names of materials.</p>		<ul style="list-style-type: none"> • <u>Types of forces</u>: air resistance, water resistance, buoyancy, upthrust, Earth's gravitational pull, gravity, opposing forces, driving force. • <u>Mechanisms</u>: levers, pulleys, gears/cogs. • <u>Measurements</u>: weight, mass, kilograms (kg), Newtons (N), scales, speed, fast, slow. • <u>Other</u>: streamlined, Earth. <p>Previously introduced vocabulary: air, heat, moon.</p>	



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Light			<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 			<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • recognise that light appears to travel in straight lines; • 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.
			<ul style="list-style-type: none"> • <u>Light and seeing</u>: dark, absence of light, light source, illuminate, visible, shadow, translucent, energy, block. • <u>Light sources</u>: e.g. candle, torch, fire, lantern, lightning. • <u>Reflective light</u>: reflect, reflection, surface, ray, scatter, reverse, beam, angle, mirror, moon. • <u>Sun safety</u>: dangerous, glare, damage, UV light, UV rating, sunglasses, direct. <p>Previously introduced vocabulary: opaque, transparent, sunlight, sun.</p>			<ul style="list-style-type: none"> • <u>Reflection</u>: periscope. • <u>Seeing light</u>: visible spectrum, prism. • <u>How light travels</u>: light waves, wavelength, straight line, refraction. <p>Previously introduced vocabulary: names and properties of materials, absorb.</p>



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Sound				<p>Pupils should be taught to:</p> <ul style="list-style-type: none">• 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.		
				<ul style="list-style-type: none">• <u>Parts of the ear</u>: eardrum.• <u>Making sound</u>: vibration, vocal cords, particles.• <u>Measuring sound</u>: pitch, volume, amplitude, sound wave, quiet, loud, high, low, travel, distance.• <u>Other</u>: soundproof, absorb sound.		



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Earth & Space					<ul style="list-style-type: none">• Describe the movement of the Earth, and other planets, relative to the Sun in the solar system• Describe the movement of the Moon relative to the Earth• Describe the Sun, Earth and Moon as approximately spherical bodies• Describe the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
					<ul style="list-style-type: none">• <u>Solar system</u>: star, planet.• <u>Names of planets</u>: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus.• <u>Shape</u>: spherical bodies, sphere.• <u>Movement</u>: rotate, axis, orbit, satellite.• <u>Theories</u>: geocentric model, heliocentric model, astronomer.• <u>Day length</u>: sunrise, sunset, midday, time zone. <p>Previously introduced vocabulary: Sun, moon, shadow, day, night, heat, light, reflect.</p>	



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electricity				<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. 		<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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.
				<ul style="list-style-type: none"> • <u>Electricity</u>: mains-powered, battery-powered, mains electricity, plug, appliances, devices. • <u>Circuits</u>: circuit, simple series circuit, complete circuit, incomplete circuit. • <u>Circuit parts</u>: bulb, cell, wire, buzzer, switch, motor, battery. • <u>Materials</u>: electrical conductor, electrical insulator. • <u>Other</u>: safety. <p>Previously introduced vocabulary: names of materials.</p>		<ul style="list-style-type: none"> • <u>Electricity</u>: mains-powered, battery-powered, mains electricity, plug, appliances, devices. • <u>Circuits</u>: circuit, simple series circuit, complete circuit, incomplete circuit. • <u>Circuit parts</u>: bulb, cell, wire, buzzer, switch, motor, battery. • <u>Materials</u>: electrical conductor, electrical insulator. • <u>Other</u>: safety. <p>Previously introduced vocabulary: names of materials.</p>



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Materials	<p>Everyday Materials</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> distinguish between an object and the material from which it is made; identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock; describe the simple physical properties of a variety of everyday materials; compare and group together a variety of everyday materials on the basis of their simple physical properties. 	<p>Use of Everyday Materials</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Rocks</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>States of Matter</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	<p>Properties and Changes of Materials</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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. 	
	<ul style="list-style-type: none"> <u>Names of materials</u>: wood, plastic, glass, metal, water, rock, paper, cardboard, rubber, fabric. <u>Properties of materials</u>: hard, soft, shiny, dull, stretchy, rough, smooth, bendy, not bendy, transparent, opaque, waterproof, not waterproof, absorbent, not absorbent, sharp, stiff. <u>Other</u>: object. 	<ul style="list-style-type: none"> <u>Changing shape</u>: squash, bend, twist, stretch. <u>Properties of materials</u>: e.g. strong, flexible, light, hard-wearing, elastic. <u>Other</u>: suitability, recycle, pollution. 	<ul style="list-style-type: none"> <u>Types of rock</u>: sedimentary rock, igneous rock, metamorphic rock. <u>Properties of rocks</u>: permeable, semi-permeable, impermeable, durable. <u>Names of rocks</u>: e.g. marble, chalk, granite, sandstone, slate. <u>Formation of rocks and fossils</u>: natural, human-made, magma, lava, molten rock, sediment, erosion, fossilisation, layers, bone, fossil. <u>Soil</u>: sandy, chalky, clay, peaty, loamy, topsoil, subsoil, bedrock, mineral, organic matter, compost. <u>Other</u>: palaeontology. <p>Previously introduced vocabulary: soil, water, air.</p>	<ul style="list-style-type: none"> <u>States of matter</u>: solids, liquids, gases, particles. <u>State change</u>: evaporate, condense, melt, freeze, heat, cool, melting point, freezing point, boiling point, water vapour. <u>Water cycle</u>: precipitation, evaporation, condensation, ground run-off, collection, underground water, bodies of water (sea, river, stream), water droplets, hail. <u>Other</u>: atmosphere. <p>Previously introduced vocabulary: temperature, rain, cloud, snow, wind, sun, hot, cold, absorb, carbon dioxide.</p>	<ul style="list-style-type: none"> <u>Properties of materials</u>: thermal conductor/insulator, magnetism, electrical resistance, transparency. <u>Mixtures and solutions</u>: dissolving, substance, soluble, insoluble. <u>Changes of materials</u>: reversible change, physical change, irreversible change, chemical change, burning, new material, product. <u>Separating</u>: sieving, filtering, magnetic attraction. <p>Previously introduced vocabulary: electrical conductor/insulator, bulb, translucent.</p>	

