Progression of Skills and Knowledge in Science

Progression in Working Scientifically Skills

Years 1 and 2	Years 3 and 4	Years 5 and 6
Asking questions and recognising that they can be answered in different ways		
Asking simple questions and recognising that they can be answered in different ways *Examine plants in a garden for signs of them having been eaten. Consider what may have eaten the plants and what else might be living in that place*	**Asking relevant questions and using different types of scientific enquiries to answer them** *What do plants need in order to grow? Investigating the effects of light, temperature, water, air on seedlings*	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** *Investigate and recreate heartrates for varying levels of exertion, giving explanations for observations*
Observing closely and taking measurements		
Observing closely, using simple equipment. *Observe closely the growth of seeds over regular periods using magnifying glasses*	**Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers** *Observe the growth of bean seedlings over time. Use data loggers to record 24 hours of light and temperature readings.*	**Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.** *Observe, measure and identify patterns in changing shadows across a day.*
Engaging in practical enquiry to answer questions		
Performing simple tests *Testing the best conditions for growing seeds* **Identifying and classifying** *Identifying plants, comparing them to named images*	**Setting up simple practical enquiries, comparative and fair tests** *Why there are differences in the growth of the seedlings? What factors are affecting growth?*	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** *Identify features in animals and plants that are passed on to offspring and explore this process by considering the artificial breeding of animals or plants e.g. dogs.*

Recording and presenting evidence		
Gathering and recording data to help in answering questions. *Set up diaries to record the growth of beans over a period of time. Use findings to suggest reasons for different growth*	**Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions** *Classify plants found in local area according to flowering, non flowering, size/shape of leaves etc.* **Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables** *Classify plants and animals, presenting this in a range of ways e.g. Venn diagrams, Carroll diagrams and keys.*	**Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs** *Classify plants and animals, presenting this in a range of ways e.g. Venn diagrams, Carroll diagrams and keys.* **Using test results to make predictions to set up further comparative and fair tests** *Undertake a study of air resistance by exploring falling paper cones or cup-cake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective.*
Answering questions and concluding		
Using their observations and ideas to suggest answers to questions *Make a collective map of a garden plot, labelling the plants and predicting what they will turn into when they are fully grown*	**Using straightforward scientific evidence to answer questions or to support their findings.** *Make a summary of class findings from the seedling investigation with notes and drawings of results.* **Identifying differences, similarities or changes related to simple scientific ideas and processes** *Create detailed models of sections through fruits showing flesh, skin, seeds etc* **Using results to draw simple conclusions, make predictions for new values and suggest improvements and raise further questions** *Report on how their requirement seems to be affecting the health/growth of seedlings*	**Identifying scientific evidence that has been used to support or refute ideas or arguments** *Exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.* **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** *Create a print advert that explores the impact of drugs and alcohol on the human body*

Progression in Knowledge

Biology: Plants

EYFS/ Early Learning Goal

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants: The Park Explorers	Ready Steady Grow: Living Things and their habitats	Plants			
To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees To identify and describe the basic structure of a variety of common flowering plants, including trees.	To know and describe how seeds and bulbs grow into mature plants To know and describe how plants need water, light and a suitable temperature to grow and stay healthy.	To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers To 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 To know the way in which water is transported within plants	Living things and their habitats	Living things and their habitats	Living things and their habitats

		To know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
Core Vocabulary					
plant wild garden look feel smell root stem leaf flower tree trunk branch evergreen leaves flower petals stem blossom seed sprout bud grow light soil air fruit	Seeds bulbs grow plants water light air temperature healthy	absorb botanist carbon dioxide deciduous evergreen flowers herbalist leaf (leaves) nutrients root stem trunk adaptations fertiliser magnesium nutrients atmosphere drop evaporate wilt anther carpel filament nectar ovary pollen stamen stigma style egg dispersal fertilisation pollination seed scent dormant germination mature seedling			

Biology: Animals including humans

EYFS/Early Learning Goal

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Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

Progression of Skills and Knowledge in Science

My Body and My Senses/Animal Groups/Animal Diets	Healthy Animals	Animals including Humans	Animals including Humans	Animals including Humans	Animals including Humans
To identify and name variety of common animals including fish, amphibians, reptiles, birds and mammals To identify and name a variety of common animals that are carnivores, herbivores and omnivores To identify and name about describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) (4)To identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	To understand that animals, including humans, have offspring which grow into adults To know the basic needs of animals, including humans, for survival (water, food and air) To describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	To know 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 To know that humans and some other animals have skeletons and muscles for support, protection and movement	To describe the simple functions of the basic parts of the digestive system in humans. To know about the different types of teeth in humans and their simple functions. To construct and interpret a variety of food chains, identifying producers, predators and prey.	To describe the changes as humans develop to old age.	To know and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. To describe the ways in which nutrients and water are transported within animals, including humans

Progression of Skills and Knowledge in Science

Core Vocabulary					
food meat plants products supermarket grow herbivore plants grind crush teeth leaves carnivore meat hunt sharp catch prey omnivore both choice snout seeds peck ocean seaweed coral gills fins underwater unusual special different surprising strange shrimp Arms Elbow Feet Knee Legs Mouth Neck Teeth Hearing Sight Smell Taste Touch Close Eyes Far Magnify See Ears Hear Loud Quiet Sound Salty Sour Sweet Taste Tongue Rough Skin Smooth Soft Touch	Healthy unhealthy strong clean air. germs sick illness food knee ear offspring adult ear breathe exercise young adult young ear head mouth head neck arm elbow tongue leg hair teeth face eye	carnivore consumer herbivore omnivore pescatarian producer vegan vegetarian carbohydrates fats minerals proteins scurvy vitamins hibernate obesity starvation collagen Fracture leukaemia osteoporosis exoskeleton biceps contract gluteus maximus muscle tendon tricep	carnivore consumer herbivore omnivore predator prey producer food chain microplastics absorption canines enamel incisors molars premolars salivary glands taste buds umami Chapter cellulose fibre indigestion heartburn ruminant ulcer anus appendix colon constipated dehydration diarrhoea faeces flatulence gut flora lactose probiotics rectum	milestones acne adolescence adolescent antiperspirant puberty scrotum testes wet dreams fetus mature menstrual cycle mood swing peer pressure period vaginal discharge womb amniotic fluid ultrasound umbilical cord gestation period Chapter Alzheimer's dementia	cardiac muscle circulatory system valves arteries blood pressure capillaries tourniquet veins varicose veins clot plasma platelet red blood cells white blood cells cholesterol stroke anaemia disorder haemophilia leukemia sickle cell

Biology: Living things and their habitats

EYFS/Early Learning Goal

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

Progression of Skills and Knowledge in Science

	Ready Steady Grow		Living things and their habitats:	Living things and their habitats:	Living things and their habitats: Classification
Plants Animals including humans Seasonal change	To know the differences between things that are living, dead, and things that have never been alive To 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 To identify and name a variety of plants and animals in their habitats, including microhabitats To 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.	Plants	To recognise that living things can be grouped in a variety of ways To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment To recognise that environments can change and that this can sometimes pose dangers to living things.	To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird To describe the life process of reproduction in some plants and animals.	To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals To give reasons for classifying plants and animals based on specific characteristics.
Core Vocabulary					
	habitat natural living log environment bush stone		characteristics conifer fern fronds invertebrates	mammary glands marsupials offspring	adaptations invertebrates

	dead ocean shelter pond microhabitat food chain rainforest seashore woodand bush stone		moss non-flowering plants properties spores vertebrates amphibians blowhole blubber cold-blooded gills mucous shiver warm-blooded Lesson abdomen antennae cocoons colonies compound eyes entomologist thorax pooter sweep net Lesson deforestation endangered extinct nature reserve slash-and-burn	camouflaged clusters embryo frog spawn metamorphosis tadpole cocoon entomologist larva/larvae (plural) moulting nymph parasites pupa/pupae (plural) scabies down egg tooth incubated asexual fertilisation ovaries ovules testes variation bulb\cutting clone plantlet regenerate tuber	vertebrates algae bacteria fungi microorganisms protozoa viruses euglena taxonomist algae bacteria fungi microorganisms protozoa viruses pooter Carl Linnaeus classification taxonomy

Biology - Evolution and inheritance

EYFS/Early Learning Goal

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Evolution and Inheritance
	Living things and their habitats	Rocks	Living things and their habitats		To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

					To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. To know that animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Core Vocabulary					
					genes offspring species variation adaptation natural selection reproduction camouflage saline amber fossils Mary Anning Charles Darwin Evolution Alfred Wallace

Chemistry: Materials

EYFS/Early Learning Goal

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Everyday Materials	Uses of everyday materials)		States of matter	Properties and changes of materials	

Progression of Skills and Knowledge in Science

To distinguish between an object and the material from which it is made. To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. To describe the simple physical properties of a variety of everyday materials. To compare and group together a variety of everyday materials on the basis of their simple physical properties.	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 To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Rocks	To compare and group materials together, according to whether they are solids, liquids or gases. To know 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). To know about the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	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. To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. To understand that dissolving, mixing and changes of state are reversible changes	

				To know 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	
Core Vocabulary					
fabric glass material metal object plastic rock wood bendy firm hard press shape soft squash stiff bumpy feel grip rough scratch slippery smooth touch? absorbent drip dry soak waterproof wet bright dull light shine shiny sparkle	hard brick dull shiny rough soft glass fabric smooth squash fold squeeze twist stretch bend elastic foil waterproof absorbent opaque translucent transparent		carbon monoxide gas liquid plasma solid sulphur dioxide melting melting point tungsten antifreeze bacteria freezing freezing point frostbite evaporation sweat sweat glands water vapour cloud condensation dew fog fungi precipitation	ceramics durability silica silicon synthetic thermal conductors thermal insulators acetone alloy dissolved soluble solution solvent fracking insoluble polymers reversible suspension microplastics sieve boulder con Lesson alkali bicarbonate irreversible neutralisation phlogiston	

Chemistry: Rocks

EYFS/Early Learning Goal

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

		Rocks: The Science of Rocks			
Everyday materials	Uses of everyday materials	To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. To describe in simple terms how fossils are formed when things that have lived are trapped within rock. To recognise that soils are made from rocks and organic matter.			Evolution and inheritance
Core Vocabulary					
		crust meteorites minerals granite igneous metamorphic mineralogist porosity properties sedimentary talc crystal lava magma obsidian pumice boulder continents Fossils meteorologist Palaeontologist pebble sediment gneiss metamorphic pressure temperature bedrock humus Silt topsoil waterlogged			

Physics: Seasonal changes

EYFS/Early Learning Goal

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasonal Changes					
To know there are changes across the four seasons To describe the weather associated with the seasons and how day length varies.		Light		Earth and space	
Core Vocabulary					
seasons spring summer autumn winter months spring blossom buds warmer rainy babies temperature sunshine daylight summer shadow thermometer autumn leaves windy cloudy crunchy weather winter frost hibernate ice bare den seasons weather daylight pattern change favourite					

Physics: Light

EYFS/Early Learning Goal

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Light			Light: The Science of Light
		To recognise that they need light in order to see things and that dark is the absence of light. To know that light is reflected from surfaces To recognise that light from the sun can be dangerous and that there are ways to protect their eyes. To recognise that shadows are formed when the light from a light source is blocked by a solid			To recognise that light appears to travel in straight lines To 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 To know that light travels from light sources to our eyes or from light sources to objects and then to

		object. To find patterns in the way that the size of shadows change			our eyes and this enables us to see things. To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
Core Vocabulary					
		absence bioluminescence Celsius mirror reflect image opaque translucent Transparent aluminium dull scattered blocked shadow position astronomer iris pupil project astronaut binoculars curved lens optician telescope			Ray surgeon opaque translucent transparent periscopes distort absorb

Physics: Forces

EYFS/Early Learning Goal

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Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

		Forces and Magnets		**Forces**	
	Uses of everyday materials	To know and compare how things move on different surfaces To notice that some forces need contact between two objects, but magnetic forces can act at a distance To know how magnets attract or repel each other and attract some materials and not others To 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 To describe magnets as having two poles To predict whether two magnets will attract or repel each other, depending on which poles are facing.		To know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object To identify the effects of air resistance, water resistance and friction, that act between moving surfaces To recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	
Core Vocabulary					
		biomechanics contractions physiotherapy tendons		catapults grit trebuchets synovial fluid aerodynamics drag	

		air resistance arthritis cartilage contact friction lubricant non-contact streamlined water resistance attract electrostatic force gravity levitation magnetic force magnetic field pole repel tides cobalt iron lodestone MRI scan nickel steel ball magnet bar magnet cylinder magnet disc magnet horseshoe magnet compass		mechanical engineer streamlined marine engineer mass clutch effort fulcrum gear lever load	

Physics: Sound

EYFS/Early Learning Goal

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Sound: The Science of Sound		
Animals, including humans			To identify how sounds are made, associating some of them with something vibrating. To recognise that vibrations from sounds		

			travel through a medium to the ear. To see patterns between the pitch of a sound and features of the object that produced it. To see patterns between the volume of a sound and the strength of the vibrations that produced it. To recognise that sounds get fainter as the distance from the sound source increases.		
Core Vocabulary					
			brass string woodwind vibration vocal cord echoes medium particle wave audible range echolocation hertz pitch sonar ultrasonography ultrasound audiologist auditory nerve cochlea ear canal eardrum hearing impairment pinna Chapter amplifier decibel		

Physics: Electricity

EYFS/Early Learning Goal

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Electricity		Electricity: Electric Circuits
			To identify common appliances that run on electricity To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers To know 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 To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit To recognise some common conductors		To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit To 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 To use recognised symbols when representing a simple circuit in a diagram.

			and insulators, and associate metals with being good conductors.		
Core Vocabulary					
			charge electrostatic forces flows nerves static electricity acid rain appliances circuit current electricity fossil fuels nuclear power pollution renewable energy Lesson battery bulb buzzer cell components motor switch voltage conductor insulator electric shock electrocuted hazards radioactive Lcarbon monoxide generator		circuit component insulator lithium switch voltage electrical engineers shaft circuit diagrams symbol diagrams electric shock risk assessment surge protector amber

Physics: Earth and space

EYFS/Early Learning Goal

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Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				Earth and Space	
				To describe the movement of the Earth, and other planets,	

				relative to the Sun in the solar system. To describe the movement of the Moon relative to the Earth. To describe the Sun, Earth and Moon as approximately spherical bodies. To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
Core Vocabulary					
				asteroid celestial bodies comet elliptical galaxy orbit sphere universe axis rotation crescent gibbous phase satellite sundial geocentric scholar heliocentric	