Vernon Park Primary School: Science Progression of Knowledge and Skills

At Vernon Park Primary School, we aim to provide all children, parents and the wider school community with a safe, caring and inclusive environment where high-quality learning experiences enable all children to be the best that they can be.

Kindness and Empathy, Friendship and Respect, Honesty and Responsibility, Tolerance and Fairness, Support and Inclusion, Challenge and Resilience.

Knowledge and Skills	EYFS	KS1	LKS2	UKS2
Scientifically	 Show curiosity and ask questions Make observations using their senses and simple equipment Making observations and taking measurements Engaging in practical enquiry to answer questions Make direct comparisons Identify, sort and group Record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets Talk about what they have done and found out Use their observations to help them to answer their questions 	During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions	During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations,	During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as

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	Kinaness and Empaing, Friendship and	d Respect, Honesty and Responsibility, Tolera	displays or presentations of results and conclusions using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments
			 identifying differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support their findings. 	
Knowledge and Skills	EYFS	KS1	LKS2	UKS2
and Skills Living things and their habitats	Explore the surrounding natural environment Explore natural objects from the surrounding environment Explore the plants in the surrounding natural environment Explore the animals in the surrounding natural environment Explore plants and animals in a contrasting natural environment	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	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

	Key vocabulary: N: name common animals in school grounds, plant, animal, seed R: wet, dry, damp, dark, light, warm, cold, describing words for animals and plants	other animals, using the idea of a simple food chain, and identify and name different sources of food Key vocabulary: nutrition, healthy, protein, carbohydrate, dairy, fat, exercise, hygiene, organism, rainforest, endangered, biodiversity, ocean, ecosystem, desert, arctic	Key vocabulary: migrate, monsoon, deforestation, biodiversity, emissions, pollution, pesticide, contaminate, drought, fresh water, marine sanctuaries, conservation areas, adapted, camouflage, coastal, grassland, classify, species, sub-group, classification key, region, blubber, ecosystem, oxygenised	Key vocabulary: classification, microorganism, habitats, living organism, species, microscopic, ecosystem, kingdom, Linnaean system, cell
Knowledge and Skills	EYFS	KS1	LKS2	UKS2
Plants	N Grow plants R Grow plants	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	

	Key vocabulary: N: plant, flower, leaf, root, stem, grass, tree	Key vocabulary: seed, plant, tree, soil, predict, stem, petal, leaf, root, flower, environment, weed, daisy, dandelion, wild, deciduous, evergreen, seasons, branch, bush, fruit, vegetable, farm, growth, seedling, young plant, adult plant, observe, photosynthesis, carbon dioxide, oxygen, glucose, pollination, germination, crop, forests	pollination, seed formation and seed dispersal Key vocabulary: fertiliser, potassium, chlorophyll, photosynthesis, xylem, phloem, anther, filament, stomata, transpiration, pollen, nectar	
Knowledge and Skills	EYFS	KS1	LKS2	UKS2
Animals, including humans	 Learn about the life cycles of animals Compare adult animals to their babies Observe how baby animals change over time Learn about the life cycles of humans Learn about how to take care of themselves Learn about their senses R Name and describe animals that live in different habitats. 	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	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	Pupils should be taught to:

Kindness and Empathy, Friendship and	d Respect, Honesty and Responsibility, Tolera	ince and Fairness, Support and Inclusion, Ch	allenge and Resilience.
 Describe different habitats Describe people who are familiar to them Learn about how to take care of themselves 	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		
Key vocabulary: N: name common farm animal, young, old, body parts, grow, baby, grown-up, children R: teeth, decay, cavity, healthy, unhealthy, energy, body parts, grow, brain, blood, living/ not living, common animals and biomes of the world,	Key vocabulary: head, body, skeleton, limb, joint, brain, eyelash, eye, sight, pupil, sound, ear, sign language, vibration, deafness, tongue, mouth, taste., flavour, sweet, touch, fingertips, skin, organ, brain, smell, odour, nose, nostril, nutrition, healthy, protein, carbohydrate, dairy, fat, exercise, hygiene, life cycle, foetus, womb, offspring, reproduction, transformation, metamorphosis, froglet, fish, amphibian, reptile, mammal, bird, feather, warm-blooded, characteristic, backbone, hatchling, gills, scale, cold-blooded, herbivore, carnivore, omnivore, predator, canines, wild, shelter, veterinary, natural,	Key vocabulary: vitamin, mineral, nutrition label, balanced, endoskeleton, exoskeleton, radius, tibia, rib cage, spine, hamstrings, biceps, digestive system, oesophagus, saliva, peristalsis, incisors, molars, enamel, fluoride, consumer, predator, tundra, hide	Key vocabulary: circulatory system, BPM, diet, pulse, oxygenated, deoxygenated, atrium, ventricle, vessel, valve, diffusion, osmosis. weather, global warming, recycle, biodegradable, net zero, greenhouse gases, industrial revolution, combustion, COP, conference, species, habitat offspring, foetus, dependent, adolescent, gestation, puberty, pregnant, toddler, prenatal, breeding, embryo, hormones.

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Knowledge and Skills	EYFS	KS1	LKS2	UKS2
Materials	 Explore a range of materials Shape and join materials Combine and mix ingredients Change materials by heating and cooling, including cooking Explore a range of materials, including natural materials Make objects from different materials, including natural materials Observe, measure and record how materials change when heated and cooled Compare how materials change over time and in different conditions 	Everyday materials Pupils should be taught to:	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

	Key vocabulary: N: hard, soft, wet, dry, seed, hot, cold, squash R: steam, liquid, boil, ice, wood, plastic, metal, glass, wool,	Key vocabulary: material, fabric, wood, plastic, metal, object, glass, property, brick elastic, opaque, transparent, dull, stiff, natural, man-made, rubber, polyester, predict, float, sink, submerge, buoyant, absorbent, sponge, waterproof, soak, solid, strong, brick, clay, wind, waterproof, absorbent, non-absorbent, slate, transparent, opaque, suitable, fabric, cotton, soft, wool, weather, evaluate, material, properties, material, property, obstacle, construction, stretchy, elastic, force, bend	Key vocabulary: igneous rocks, intrusive igneous rocks, extrusive igneous rocks, magma, sedimentary rock, metamorphic rock, weathering, acid rain, erosion, fossil, decompose, fragments thermometer, melting point, freezing point, boiling point, solid, liquid, gas, evaporation, particles, condensation, water vapour, substance.	and the action of acid on bicarbonate of soda Key vocabulary: solute, solvent, reversible, evaporate, chemical change, effervescent, fair test, corrosion, combustion, extinguish, reaction, carbon dioxide., conductive, magnetic, thermal, conduction, hardness, force, dissolve, solute, solvent, substance, filtering, evaporation.
Knowledge and Skills	EYFS	KS1	LKS2	UKS2
Seasonal Changes	Discuss the weather and which clothes we should wear Play and explore outside in all seasons and in different weather Play and explore outside in all seasons and in different weather Observe living things throughout the year	 Pupils should be taught to: observe changes across the 4 seasons observe and describe weather associated with the seasons and how day length varies 		
	Key vocabulary:	Key vocabulary:		

Knowledge and Skills	R: ice, freeze, melt, cold, temperature, warm, Autumn, Winter, Spring, Summer, grow, migrate, hibernate, bulb, seed, nest, egg EYFS	season, spring, summer, autumn, winter, hibernate, weather, protect, harvest, frost, sleet, temperature, compare, changes, grow, chick, warm, sun protection, heatwave, rainfall, measuring, record, results, graph KS1	LKS2	UKS2
Light	 Explore light sources Shine light on or through different materials Explore shadows Explore rainbows Key vocabulary: N: light, dark, shadow, sun, torch, 		 Pupils should be taught to: recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by a solid object find patterns in the way that the size of shadows change Key vocabulary: light, reflect, vitamin D, ultraviolet 	Pupils should be taught to: • 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 Key vocabulary: light, light source, reflected, variable,
	R: light, dark, bright, shadow, colours, mix		rays, fluorescent, high visibility, shadow, ray, cast, position, shape, puppet	angle, mirror, opaque, transparent, sunshade, rotate, optical, spectrum.
Knowledge and Skills	EYFS	KS1	LKS2	UKS2
Forces and magnets	Feel forcesExplore how things work		Pupils should be taught to: compare how things move on different surfaces notice that some forces need contact between 2 objects, but	Pupils should be taught to: • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object

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	 Explore how objects/materials are affected by forces Explore how to change how things work Explore how the wind can move objects Explore how objects move in water 		 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 	 identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect
	Key vocabulary:		Key vocabulary:	Key vocabulary:
	N: push, pull, slow, fast, turn		force, friction, motion, texture,	Sir Isaac Newton, gravity, Galileo
	R: push, pull, wheel, seesaw, heavy,		magnet, attract, repel, magnetic field,	Galilei, parachute, water resistant,
	light, turn		non-contact force, magnetism,	streamlined, buoyant, upthrust,
			compass, orienteering	friction, Newton, lever, pulley.
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Knowledge and Skills Electricity	EYFS N	KS1	LKS2 Pupils should be taught to:	UKS2 Pupils should be taught to:

	Key vocabulary: N: switch, on, off, safe, dangerous, battery, plug		 recognise some common conductors and insulators, and associate metals with being good conductors Key vocabulary: electricity, batteries, circuit, voltage, current, bulb, conductor, insulator, switch, control, wind turbines, hydropower 	Key vocabulary: circuit, battery, electricity, resistor, variable resistor, dimmer switch, output, systematically, synchronised, signal, conductor, insulator.
Knowledge and Skills	EYFS	KS1	LKS2	UKS2
Sound	 Listen to sounds Make sounds Listen to sounds outside and identify the source Make sounds 		 Pupils should be taught to: identify how sounds are made, associating some of them with something vibrating recognise that vibrations from sounds travel through a medium to the ear 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 	
	Key vocabulary: N: loud, quiet, instrument, name some instruments. R: loud, quiet, instrument, volume		Key vocabulary: vibration, medium, source, energy, materials, reflect, volume, decibels, pitch, instruments, particles, sound source	

Knowledge	EYFS	KS1	LKS2	UKS2
and Skills Earth and Space	R • Learn about the Earth, Sun, Moon, planets and stars • Learn about space travel			Pupils should be taught to: • 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
	Key vocabulary: R: light, dark, bright, day, night, Sun, moon, Earth, rocket, astronaut			Key vocabulary: heliocentric, geocentric, solar system, astronomy, gas giants, terrestrial planet, axis, orbit, moon, phase, waxing, waning.
Knowledge and Skills	EYFS	KS1	LKS2	UKS2
Evolution and inheritance				Pupils should be taught to: • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents identify how animals and plants are adapted to suit their environment in

		different ways and that adaptation may lead to evolution
		Key vocabulary: inherit, epiphytes, adaptation, fossil, Mary Anning, palaeontologist, ichthyosaurus, Charles Darwin, evolved, natural selection, ancestor, homo sapiens.