

PROGRESSION IN SCIENCE								
Date		Review Date			Subject Leader			
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<p>This document aims to give guidance on the progression of Science knowledge and skills across the year groups. It can also be used to differentiate work, and expectations, appropriately for pupils working above and below age-related expectations (particularly SEND pupils and GD pupils). Through practical learning opportunities, children will be able to make connections and reflect on prior knowledge enabling them to become Inquiry-based learners.</p>								
<p>In Science, like all other subjects, we recognise the importance of the methods and practice of teaching (the pedagogy) we choose to use in enabling pupils to know more, understand more and remember more. In Science, the following approaches will be used, and be evident in pupil discussion, observations and work in books, in order to ensure that the Science learning opportunities are as effective as possible and that pupils progress throughout the year and across year groups during their experience of Science school:</p>								
Teaching Sequence in Science	Big Picture: Start with what the children know, understand, are able to do and able to say. Daily Review: Revisit previous learning.		Possible pedagogical approaches used in Science	Behaviourism	Direct teacher instruction; modelling of skills and techniques; demonstration			
	Provide information and scientific concepts.			Constructivism	Inquiry-based learning			
	Specify key vocabulary to be used and its meaning.			Social Constructivism	Teacher modelling; questioning; mix of individual, paired and group instruction			
	Provide opportunities for the children to investigate in a variety of contexts.			Liberationism	Pupil-led learning; opportunities			
	Obtain and present evidence through observations, comparisons and collected data.			Learning, working and talking about Science with confidence.				
	Consider and evaluate evidence making connections with scientific knowledge and understanding.			Being introduced to the key vocabulary relating to Science so that all children can express their understanding, findings, and conclusions.				
	UFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
Animals including Humans	<p>Understanding the world: Early Learning Goal: They make observations of animals and plants and explain why some things occur, and talk about changes.</p>	<p>What are the five senses and how do we use these to find out about the world Explain their ideas as responses to an issue.</p> <p>What do we call common animals?</p> <p>How can we compare them?</p> <p>(fish, amphibians, reptiles, birds and mammals)</p> <p>(carnivores, herbivores and omnivores)</p>	<p>How do humans keep healthy? (exercise, food, hygiene)</p> <p>What are the basic needs for survival? (water, food, air)</p>	<p>Why do animals and humans need the right amount of nutrition?</p> <p>How do animals and humans get their nutrition from what they eat?</p> <p>Why do we have a skeleton and what does it protect?</p> <p>How do animals move their muscles?</p> <p>How do muscles work?</p>	<p>What are the simple functions of the basic parts of the digestive system in humans?</p> <p>What are the different types of teeth in a human and what are their simple functions.</p> <p>What is a food chain?</p> <p>What are producers, predators and prey?</p>	<p>What are the changes as humans develop to old age?</p>	<p>What are the main parts of the human circulatory system?</p> <p>What are the functions of the heart, blood vessels and blood?</p> <p>What is the impact of diet, exercise, drugs and lifestyle on the way the body functions?</p> <p>What ways are nutrients and water transported within animals, including humans?</p>	
Vocabulary	Plant, Animal	Senses Fish, Reptiles, Mammals, Birds, Amphibians Herbivore, Omnivore,	Survival, Water, Air, Food, Adult, Baby, Offspring, Kitten, Calf, Puppy, Exercise, Hygiene	Nutrition Movement, Muscles, Bones, Skull, Nutrition, Skeleton,	Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine,	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty,	Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration, oxygen, carbon dioxide,	

		Carnivore, Wings, Beak			Incisor, Molar, Producer, consumer, predator, prey, food chain	adolescent, adult, life cycle, reproduction	lungs, diet, drugs, lifestyle
Plants	Understanding the world: Early Learning Goal: They make observations of animals and plants and explain why some things occur, and talk about changes.	Can you name the parts of a flowering plant and trees? What do plants need to grow well? What plants can you find by our school? Can you identify the different types of trees? (deciduous and evergreen trees)	How do seeds and bulbs grow into mature plants? Why do plants need water, light and suitable temperature to grow and stay healthy?	What are the parts of a flower? How does each part work? Can you describe the life cycle of a flowering plant? What is pollination? How are seeds dispersed? How is water transported through the plant? What does a plant need to grow and survive? (air, light, water, nutrients from soil and room to grow) What is the job of roots, leaves and stems/trunk and flowers?			
Vocabulary	Plant, Flower, Grass, Tree	Deciduous, Evergreen trees, Leaves, Flowers, Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem	Seeds, Bulbs, Water, Light, Temperature, Growth	Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower			
Living things and their habitats	Understanding the world: Early Learning Goal: They make observations of animals and plants and explain why some things occur, and talk about changes.		How can we sort living, dead and never been alive things? What is a food chain? What is a habitat? Why do animals live in their habitat?		How can we group living things? How do I use a key to identify local plants and animals? How can environments change? How can this	What is the difference between the life cycles of a mammal, an amphibian, and insect and a bird? How do plants and animals reproduce?	How are living things classified into groups? (Common characteristics and based on similarities and differences including micro-organisms, plants and animals)

			What is a microhabitat? Identify/name plants and animals including microhabitats.		effect or danger living things? What ways can we protect living things and the environment?		Why do we classify plants and animals? (specific characteristics)
Vocabulary	Plant, Animal, Home		Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Woodland, Pond, Desert		Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats	Mammal, Reproduction, Insect, Amphibian, Bird, Offspring, pollen, stigma, stamen, seed formation/dispersal, germination, pollination	Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles, Mammals, Insects, crustacean, arachnid, offspring, mollusc
Seasonal Change	Understanding the world ELG: They make observations of plants and explain why some things occur, and talk about changes	How do the seasons change over the year? How does the weather change depending on the season? Why is there more sunlight in summer than winter?					
Vocabulary	Weather rain sunshine snow cloud	Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark					
Evolution and Inheritance							How do living things change over time? What information does a fossil provide? (information about living things that inhabited the Earth millions of years ago) Do offspring have the same characteristics as their parents? (Living things produce offspring of the same

							<p>kind, but normally offspring vary and are not identical to their parents.)</p> <p>How do animals and plants adapt to suit their environment?</p> <p>How does adaptation lead to evolution?</p>
Vocabulary							<p>Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, inherit</p>
Materials	<p>Understanding the world ELG: The world Children know about similarities and differences in relation to places, objects, materials and living things.</p>	<p>What material is an object made from?</p> <p>What are the names of everyday materials? (wood, plastic, glass, metal, water and rock)</p> <p>Can you describe the material? Can we compare and group materials?</p>	<p>How can we use everyday materials?</p> <p>Which materials are waterproof? Which materials are strong and weak? Which material would we use for.....?</p> <p>Identify and compare the suitability of a variety of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Can a material change shape?</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>			<p>How can we compare and group together everyday materials based on their properties?</p> <p>Including hardness, solubility, transparency, conductivity (electricity and thermal) and response to magnets.</p> <p>What is a substance? What is a solution? Can we recover a substance?</p> <p>Some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Separate solids, liquids and gases through filtering, sieving and evaporating</p> <p>How can we test materials?</p> <p>What is the difference between irreversible</p>	

						<p>and reversible changes of state?</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Some changes result in the formation of new materials.</p> <p>Changes associated with burning and the action of acid on bicarbonate of soda are irreversible</p>	
Vocabulary	Sand, Playdough, Paint, Mix, Soft, Hard	Wood, Plastic, Glass, Paper, Water, Metal, Rock, Hard, Soft, Bendy, Rough, Smooth	Stretchy, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil			<p>Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing, insoluble, mixture, separating, evaporating, reversible and irreversible change, burning, rusting, sieving, residue</p>	
States of Matter	<p>Understanding the world ELG: The world 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.</p>				<p>How can we compare and group materials together according to whether they are solids, liquids or gases?</p> <p>How do some materials change state when they are heated or cooled?</p> <p>How can I can measure temperature?</p> <p>What is evaporation and condensation?</p> <p>How does evaporation change when temperature changes?</p>		
Vocabulary	Hard, Soft, Water, Hot, Cold				Solid, Liquid, Gas, Evaporation, Condensation, Particles,		

					Temperature, Freezing, Heating, water vapour, solidify, change state, boil		
Forces	Understanding the world ELG: The world Children know about similarities and differences in relation to objects and materials.	How do objects move? How do you stop or slow down an object?	What are pushes and pulls? How can we control speed, direction of an object? How do they effect an object – can pushes and pulls change the shape of objects?	How do objects move on different surfaces? How do magnets attract, repel each other? Which materials are magnetic? How do the two poles effect magnetism? How can we compare and sort magnetic and non-magnetic materials?		Why do unsupported objects fall towards the Earth? (forces of gravity) What are the effects of air resistance, water resistance and friction on moving surfaces? That some mechanicalness, including levers, pulleys and gears, allow a smaller force to have a greater effect.	
Vocabulary	Stop, Start	Stop, start, roll, Move Slow fast	Push, pull, speed, direction Force	Magnetic, Force, Contact, Attract, Repel, Friction, Poles, Push, Pull		Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys	
Rocks	Understanding the world ELG: The world 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.			How can we compare and group together different kinds of rocks? How are fossils formed? (when things have lived and then are trapped within rock) How is soil made? (from rocks and organic matter)			
Vocabulary	Hard, Smooth, Rough			Fossils, Soils, Sandstone, Granite, Marble, Pumice, Crystals, Absorbent			
Electricity	Understanding the world ELG: The world Children know about similarities and				What common appliances run on electricity?		How does the number and voltage of cells effect the brightness of a lamp

	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.				<p>Construct a simple series circuit</p> <p>What are the different parts to a circuit? Including cell, wires, bulbs, switches and buzzers</p> <p>How does a lamp work as part of a circuit?</p> <p>How does a switch work and will this light the lamp in the simple series circuit?</p> <p>What are the common conductors and isolators?</p> <p>Are metals good conductors?</p>	<p>or the volume of a buzzer?</p> <p>Compare and give reasons for variations in how components function including brightness of bulb, loudness of buzzer, on/off position of switches.</p> <p>What symbols are used in an electrical circuit?</p> <p>Recognise symbols when representing a simple circuit in a diagram.</p>
Vocabulary	Bright, Dark				Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators Connection, electricity	Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts, Cell, negative , positive
Earth and Space	Understanding the world ELG: The world 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.					<p>How does the Earth and planets move?</p> <p>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</p> <p>Why does the sun seem to move across the sky, rising in the East and setting in the West?</p> <p>Why do we have day time and night time?</p>
Vocabulary						Earth, Sun, Moon, Axis, Rotation, Day, Night,

	The world, Sky, Space, Stars, Planets					Phases of the Moon, star, constellation, Solar System, planets, orbit	
Sound	Understanding the world ELG: The world 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.				How are sounds made? (vibration) Vibrations travel through a medium to the ear Find patterns between the volume of a sound and the strength of the vibration What happens to sound as the distance from the sound source increases?		
Vocabulary	Quiet, Loud				Volume, Vibration, Wave, Pitch, Tone, travel, strength		
Light	Understanding the world ELG: The world 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.			Recognise the need for light to see things and that dark is the absence of light? How is light is reflected from surfaces? Why should we wear sunglasses? How is a shadow formed? Shadows are formed when the light from light sources is blocked by a solid object.			What direction does light travel? How do we see things? (light travels from light sources to our eyes or from light sources to objects then to our eyes) How does light travel? Understand that light travels in straight lines which explain why shadows have the same shape as the object that cast them.
Vocabulary	Bright, Dark			Light, Shadows, Mirror, Reflective, Dark, Reflection			Refraction, Reflection, Light, Spectrum, Rainbow, Colour, dark, shadow, absorb, symbol,

							diagram, opaque, translucent
	Working Scientifically						
	UFS	Year 1/Year 2	Year 3/Year 4	Year 5/Year 6			
Asking Questions		Ask simple questions and recognise that they can be answered in different ways.	Ask relevant questions and use different types of scientific enquiries to answer them Set up simple practical enquiries, comparative and fair tests.	Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.			
Measuring and Recording		Observe closely, using simple equipment. Perform simple tests. Gather and record data to help in answering questions.	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units. use a range of equipment, including thermometers and data loggers Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Gather, record, classify and present data in a variety of ways to help in answering questions.	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.			
Concluding		Identify and classify Use their observations and ideas to suggest answers to questions.	Identify differences, similarities or changes related to simple scientific ideas and processes Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Use straightforward scientific evidence to answer questions or to support their findings.	Identify scientific evidence that has been used to support or refute ideas or arguments. Report and present 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.			

Evaluating			Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	Use test results to make predictions to set up further comparative and fair tests.
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