Science progression grid

National Curriculum Aims

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Cultural capital

'It is the essential knowledge that pupils need to be educated citizens, introducing them to the best that has been thought and said and helping to engender an appreciation of human creativity and achievement.'

Cultural capital is woven into Science at every opportunity. For example in Year 2 the children experience planting and growing carrot seeds. In Nursery the children have the opportunity to watch ducklings hatch and grow.

Nursery	Reception
Autumn	
• Pupils recognise and use their senses, talk about what they can see and explore the nursery environment. • Explore and talk about different forces they can feel. Pupils will learn to: - name and recognise colours and objects around them. - Explore how different materials sink and float. - Explore how you can shine light through some materials, but not others. Investigate shadows.	
Spring	
• Pupils recognise that there are different types of food and will understand how some foods grow and talk about what a balanced diet is. Pupils will learn to: - talk about a balanced diet and name fruits and vegetables. • Understand key features of a life cycle of a plant and animal. Pupils will learn to: - Plant seeds and care for growing plants.	• Pupils recognise some environments that are different to the one in which they live Pupils will learn to: - plant bulbs - name some of the planets -Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and say which planet is closes to the sun – Mercury. - say who was the first man on the moon – Neil Armstrong - name the planet I live on - Earth say what a plant needs to grow – water and sunlight

- understand the need to respect and care for the natural environment and all living things - talk about growth change and life cycles of a plant and animal.	• Recognise some environments that are different to the one in which they live. Pupils will learn to: -name some different dinosaurs (Tyrannosaurus Rex, Stegosaurus, Diplodocus, Triceratops, Brontosaurus, Plesiosaur, Pterodactyl) - explain what a herbivore, carnivore and omnivore eat -say how long ago dinosaurs lived -describe a dinosaur's environment
Summer	
• Explore the seaside, different sea creatures and mermaids. Pupils will learn to: - talk about the seaside and how to travel to and from a holiday destination.	• Explore the natural world around them. • Name and identify different mini-beasts and farm animals. Understand the effects of changing seasons on the natural world around them Pupils will learn to: - Make observations and draw pictures of animals and plants. - Sort and name mini-beasts by different features: such as: Body, legs, wings, antennae, shell, sting, pincers, stripes, spots, - Name and match adult farm animals to their young; such as:

			Cow and calf, goat and kid, sheep and lamb, pig and piglet, duck and duckling, horse and foal, chicken and chick.		
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including humans					
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	**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	**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,	**Pupils should be taught to:** · describe the simple functions of the basic parts of the digestive system in humans; · identify the different types of teeth in humans and their simple functions; · construct and interpret a variety of food chains, identifying	**Pupils should be taught to:** · describe the changes as humans develop to old age.	**Pupils should be taught to:** · identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood; · recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function;

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.	amounts of different types of food, and hygiene.	protection and movement.	producers, predators and prey.		• describe the ways in which nutrients and water are transported within animals, including humans.
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	**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			

flowering plants, including trees.		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.			
		Living things and their habitats			
	Pupils should be taught to: • explore and compare the differences between things that are living, dead, and things that have never been alive;		**Pupils should be taught to:** • recognise that living things can be grouped in a variety of ways; • explore and use classification keys to help	**Pupils should be taught to:** • describe differences in the life cycles of a mammal, an amphibian, an insect and a bird; • describe the life process of	**Pupils should be taught to:** • describe how living things are classified into broad groups according to common observable characteristics

	• 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		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.	reproduction in some plants and animals.	and based on similarities and differences, including micro-organisms, plants and animals; • give reasons for classifying plants and animals based on specific characteristics.

	and name different sources of food.				
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.
Seasonal changes					
Pupils should be taught to: · observe changes across the 4 seasons; · observe and describe weather associated with the seasons and how day length varies.					

Forces					

		Forces and Magnets **Pupils should be taught to:** • 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		Forces **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; • 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	

		magnetic materials; • describe magnets as having 2 poles; • predict whether 2 magnets will attract or repel each other, depending on which poles are facing.		to have a greater effect.	
Light and sound					

		Light **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 an opaque object; • find patterns in the way that the size of shadows change.	Sound **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;		Light **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

			• recognise that sounds get fainter as the distance from the sound source increases.		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.
Earth and Space					
				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.	
Electricity					
			Pupils should be taught to: • 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;		**Pupils should be taught to:** • 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

			• 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.		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.
Materials					

Everyday Materials	Uses of Everyday Materials	Rocks	States of Matter	Properties and Changes of Materials	Everyday Materials
Pupils should be taught to: • distinguish between an object and the material from which it is made; • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock; • describe the simple physical properties of a variety of everyday materials; • compare and group together a variety of everyday materials on the basis of	**Pupils should be taught to:** • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses; • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	**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.	**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	**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	**Pupils should be taught to:** • distinguish between an object and the material from which it is made; • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock; • describe the simple physical properties of a variety of everyday materials; • compare and group together a variety of

their simple physical properties.			associate the rate of evaporation with temperature.	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	everyday materials on the basis of their simple physical properties.

				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.	
Working scientifically					
pupils should be taught to use the following practical scientific methods, processes and skills: .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		pupils should be taught to use the following practical scientific methods, processes and skills: · 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		pupils should be taught to use the following practical scientific methods, processes and skills: · planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary; · taking measurements, using a	

to suggest answers to questions; • gathering and recording data to help in answering questions. .	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, displays or presentations of results and conclusions; • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions; • identifying differences, similarities or changes related to simple scientific ideas and processes; • using straightforward scientific evidence to answer questions or to support their findings.	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 displays and other presentations; • identifying scientific evidence that has been used to support or refute ideas or arguments.