Scientific Knowledge and Understanding – Progression Map and Intent

Overview

*There are strong links between the EYFS/KS1 And LKS2 science curriculum, clearly demonstrating that the science curriculum, assessment and pedagogy have:
- Continuity
- progression

*Science teachers collaborate, plan and provide a range of joint activities/events for pupils.

*Schools and teachers exchange information, co-ordinate science activities, share science resources

*Teachers collaborate to plan progression in cross-curricular skills required for science:

- Literacy
- Numeracy
- ICT
- Problem solving
- Thinking

*Teachers share good practice and expertise in approaches to teaching, learning and assessment.

Our high-quality science curriculum provides the foundation for understanding the world. Science has changed our lives and is vital to the world's future prosperity; all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science.

Intent

We want our pupils to become inquisitive and explorative about the world around them. We want them to expand their knowledge from the Early Years wider world learning and to love, respect, and investigate their natural world as well as themselves. We want them to ask question to research further outside of the classroom and to be respectful of everything and everyone around them. We further believe that the acquisition of knowledge, skills and understanding of science in the curriculum is essential for the child's future learning and to prepare them for adult life.

Implementation

- We will provide a wide range of scientific experiences for all pupils regardless of age, ability, gender, specific educational needs or disability which encourages their love of learning and passion for investigation.
- We will teach scientific skills to pupils through a progressive programme of study.
- We will ensure that children can record their results in a variety of ways, building on writing up investigations with data included.

- We will provide differentiated teaching to conceptual needs of the full ability range in each year group.
- We will help the children to develop an enquiring and questioning approach to scientific discover through a range of concepts and starting points.
- We will help the children to develop a problem solving approach to scientific experimentation where they lead their learning.
- We will help the children to develop close observation and precise recording which demonstrates their learning through their key phase.
- We will relate scientific knowledge to everyday experience.
- We will ensure science teaching and learning is safe and use a range of resources to excel the children's learning.
- We will assess and monitor pupil's progress against National Curriculum/levels of attainment.

Impact

- Pupils will develop a love of learning, investigating, experimenting and will want to test the theories to their fullest.
- Pupils will work hard to meet the challenges of the growing curriculum and become resilient in their investigations.
- Pupils will learn to draw upon prior learning and enhance this learning with research, experimentation and concluding.
- Pupils will become independent and determined learners who tackle problem solving with inquisitive attitudes.

Plants						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To make simple observations about plants and explain why some things occur.	To name common plants To describe the basic structure of flowering plants, including deciduous and evergreen To identify and describe the basic structure of a variety of common flowering plants, including trees.	To observe and describe how seeds and bulbs grow into mature plants. To describe how plants needs water, light and suitable temperature to grow healthy and strong.	To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers To describe the requirements of plants for life and growth and how they vary from plant to plant. To investigate the way in which water is transports within plants.			

			To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal			
Plant, leaf, stem, flower, grow, rain, sun, water, soil, seed	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud	All Year 1 vocab + Sun, warm, cool, water, grow, healthy	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal, wind dispersal, pollen, roots, stem, trunk, leaves, absorb, nutrients, reproduce, germination, stamen, style			

Animals including humans						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To notice changes in their bodies after exercise, such as heart beating faster	To identify a variety of common animals, including: fish, amphibians, reptiles, birds and mammals	To know animals including humans, have offspring, which grow into adults.	To identify the right types and amount of nutrition human and animals needs.	To describe the simple functions of the basic parts of a human digestive system.	To describe the changes as humans develop from birth to old age.	To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
To understand the importance of hand washing	To identify a variety of common animals that are carnivores, herbivores and omnivores.	To describe the basic needs of animals, including humans, for survival (water, food and air)	To explain that most animals (including humans) have skeletons muscles for support, protection and movement.	To identify the functions of different human teeth.		To identify the main parts of the human circulatory system and describe the function of the heart, blood vessels and blood.
	To describe and compare the structure of a	To describe the importance of exercise, eating the		To construct and interpret a variety of food chains		To describe they ways in which nutrients and water

	variety of common animals (fish, amphibians, reptiles, birds, mammals) To label the body parts of a human body and say which part of the body is associated with each sense.	correct amount of different types of food, hygiene.		(identifying the producers, predators and prey).		are transported within animals, including humans.
head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, heart,	amphibian, mammal, omnivore, carnivore, herbivore, touch, taste, smell, feel, hear, see	Offspring, grow, adults, nutrition, reproduce, survival, water, food, air, exercise, hygiene, survival, exercise.	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, skull, ribs, spine, muscles, joints.	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, incisor, canine, herbivore, omnivore.	Egg, sperm, ovary, testes, fertilisation, puberty	Heart, pulse, rate, pumps, blood, blood vessel, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle.

Living Things						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To identify similarities and differences between themselves and others, and among families, communities and traditions.		To compare differences between things that are living, dead and things that have never been alive.		To recognise that living things can be grouped in a variety of ways.	To describe the differences in the lifecycles of a mammal, an amphibian, an insect and a bird.	To describe how living things are classified in broad groups according to common characteristics and based on similarities and differences, including micro - organisms, plants and animals.

They can talk about their environment.		To identify that most living things live in habitats to which they are suited		To group, identify and name a variety of living things in their local environment.	To describe the life processes of reproduction in some plants and animals.	To give reasons for classifying plants and animals based on specific characteristics
		To identify and name a variety of plans and animals in their habitats, including microhabitats. To describe how animals obtain their food from plants and other animals using a simple food chain.		To recognise that environments can change and that this can sometimes pose dangers to living things.		
		Living, dead, never been alive, suited, suitable, basic need, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland, names of micro habitats e.g. under logs, in bushes etc.		Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate.	Lifecycle, mammal, amphibian, germination, seed formation, insect, bird, pollination, life processes, plants, animals, reproduction, environment, dispersal, growth, living, eggs, and seeds.	Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non - flowering.

Evolution and Inheritance						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						To recognise that living things produce offspring of the same kind, but normally

offspring vary and are not identical to their parents.
To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
To recognise that living things have changed over times and fossils provide information about living things that inhabited the Earth millions of years ago.
offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils.

Materials						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To introduce and encourage children to use the vocabulary of manipulation e.g. squeeze and prod	To distinguish between an object and the material from which it is made.	To identify the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and			To compare materials on the basis of their properties, including hardness, solubility, transparency,	

		cardboard for particular uses.	
To talk about why things happen and how things work.	To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.	To discover how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	conductivity 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 notice changes in properties as they are transformed through becoming wet, dry, flaky or fixed.	To describe the simple physical properties of a variety of everyday materials.		To use knowledge of solids, liquids 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 demonstrate that dissolving, mixing and changes of state are reversible changes. To explain that some changes result in the formation of new materials and this kind of change is not usually reversible, including changes associated with
	To compare everyday materials based on their simple physical characteristics.		

					burning and the action of acid on bicarbonate of soda.	
Wet, dry, shiny, dull, bendy, stiff, squashy, hard/soft, lumpy, wrinkly. Smooth, rough	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through	Names of materials: wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber, suitable/unsuitable, use/useful, hard/soft, stretchy/stiff. Rigid/flexible, waterproof/absorbent, strong/weak, rough/smooth, transparent/opaque, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching			Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/not reversible, change, burning, rusting, new material.	

States of Matter						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				To compare and group materials together, according to whether they are solids, liquids or gases. To 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 To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle		
Rocks and Soils						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			To compare 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 a rock. To recognise that soils are made from rocks and organic matter.			

			Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb, water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil.			
Seasonal Changes						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To show concern and care for the environment. To notice changes and differences in the environment. To develop an understanding of decay and changing over time. Snow, wind, rain, sun, day, night, stormy, cloudy, hot, foggy	To observe changes across the four seasons. To observe and describe weather associated with the seasons. To observe how day length changes. Weather (e.g. sunny, rainy, windy, snowy etc.), winter, summer, spring, autumn, sunrise, sunset, day length					
Earth and Space						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					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. Describe the Sun, Earth and Moon as approximately spherical bodies.
To use Earth rotation to explain day and night due to the apparent movement of the sun across the sky.
Earth, sun, moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune, Pluto (dwarf planet), spherical, solar system, rotates, star, orbit, planets, axis, night, day, season, galaxy. Meteorite.