Science PoS Progression

Introduction

- **Bullet points denote statements from National Curriculum in England or Development Matters**
- **Reference will be made to the previous year's sticky knowledge and vocabulary before starting a topic to assess what the children have retained.**
- **The vocabulary included for EY are words that children should be exposed to. They should use some correctly in a scientific context.**
- **The vocabulary from Year 1 onwards are words that children should know and use correctly in a scientific context. They should be able to define the specialist scientific vocabulary included**
- **The working Scientifically vocabulary identified in the final table of this document should be taught through the topics in each year group during practical work or scientific enquiry**
- ***Key knowledge (Substantive knowledge)* Skills (Disciplinary knowledge)**

	EYFS
	Working scientifically: Children talk about what they see. E.g looking closely at cut plants and fruit, using a magnifier to look at minibeasts, tadpoles, leaves etc
Forces	**Pupils should be taught to:** **3-4 year olds will be learning to:** • Explore and talk about different forces they can feel (push and pull)
Animals including Humans	**Reception will be learning to:** • Understand the concept of day and night *Daytime is when you can see the sun from where you are, it is light. Night time is when the sun is on the other side of the world and it is dark outside.* • Know that some animals are only active at night – nocturnal (foxes, badgers, owls, bats) *Some animals will sleep during the day and become active at night.* **Early Learning Goals:** ● Explore the natural world around them, making observations and drawing pictures of animals
Vocabulary	Day, night, active, sleep, nocturnal, smell, hear, sight, fox, badger, owl, bat
Plants	**Reception will be learning to:** • Name some common flowers (sunflower, daisy) *A daisy is a common wild flower growing in the grass, they are white and yellow. A sunflower is yellow with seeds in the middle.* • Label parts of a flower *Flowers have roots, a stem, petals and leaves* • Describe what plants need to grow *Plants need water, soil and sunlight to grow* **Early Learning Goals:** ● Explore the natural world around them, making observations and drawing pictures of plants

Vocabulary	Plants - Stem, roots, flower, petal, leaf, soil, water, sunlight, seed, rain, bean
Living Things and their Habitats	**Pupils should be taught to:** **3-4 year olds will be learning to:** ● Use all their senses in hands-on exploration of natural materials. ● Explore collections of materials with similar and/or different properties. ● Begin to understand the need to respect and care for the natural environment and all living things. Reception will be learning to: ● Explore the natural world around them ● Recognise some environments that are different to the one in which they live. ● Describe what they see, hear and feel whilst outside. **Early Learning Goals:** ● Explore the natural world around them, making observations and drawing pictures of animals ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class
Vocabulary	Frogspawn, tadpole, butterfly, frog, spider, ladybird etc Home, lives
Seasonal Change	**3-4 year olds will be learning to:** ● Talk about what they see during autumn, spring and summer **Reception will be learning to:** • Name the 4 seasons (Autumn, spring, summer winter) *Autumn is the season where leaves change colour and fall of the trees. Winter is the season where trees are bare and it is cold outside. Spring is when plants start to grow and baby animals such as calves and lambs are born. Summer is the season when it becomes warmer outside and the trees will be green.* **Early Learning Goals** ● Understand some important processes and changes in the natural world around them, including the seasons
Vocabulary	Seasons, spring, summer, autumn, winter, leaves, bare, grow, calves, lambs, colours
Materials	**Pupils should be taught to:** **3-4 year olds will be learning to:** ● Use all their senses in hands-on exploration of natural materials. ● Explore collections of materials with similar and/or different properties. ● Talk about the differences between materials and changes they notice.

	Reception will be learning to: ● Explore the natural world around them ● Describe what they see, hear and feel whilst outside. **Early Learning Goal** ● Understand some important processes and changes in natural world around them, including changing states of matter
Vocabulary	Plastic, metal, wood
Space	**Reception will be learning to:** • Identify key features of space (sun, moon, stars, Earth, planets) *We live on planet Earth. There are 8 planets in our solar system. There is more than one moon in our solar system but Earth only has one. We have day and night.* **Early Learning Goal** • To explore the natural world around them
Vocabulary	Moon, Earth, stars, sun, land, water, solar system, planets, craters, day, night, light, dark

Fairfield Road Primary School
Science PoS Progression

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals Including Humans *Prior Sticky Knowledge EYFS: I can talk about and make observations of the animals that I have learned about including nocturnal animals. I can show care and concern for living things and the environment.	**Pupils should be taught to:** •identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals; •describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets); *Amphibians live the first part of their lives in the water and the last part on the land. Reptiles are cold-blooded animals and they lay eggs. Reptiles live on land and in water. All mammals have hair, lungs, are warm blooded and can live on land or in water. Most mammals give birth to live babies. But there are a few mammals who lay eggs. A fish uses its gills to breathe, they have scales and lay soft eggs. Birds lay eggs and have a beak, they all lay eggs but not all birds can fly.* •identify and name a variety of common animals that are carnivores, herbivores and omnivores*; An omnivore is an animal that eats animals and plants. Animals that eat only*	**Pupils should be taught to:** •notice that animals, including humans, have offspring which grow into adults; *Animals including humans reproduce when they reach maturity. All animals including humans will eventually die.* •find out about and describe the basic needs of animals, including humans, for survival (water, food and air); *Animals move in order to survive. Different animals move in different ways to help them survive. Animals including humans need air, water, food and shelter to survive.* •describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. *Exercise keeps animals including humans, bodies in good condition and increases survival chances.*	**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; *Different animals are adapted to eat different foods. Plants can make their own food using the energy from sunlight, however animals, including humans need to eat in order to stay alive. Humans need to eat different types of food. We can place food into five food groups according to how they help us to stay healthy. • Bread, cereal and potatoes (carbohydrates) • Fruits and vegetables (vitamins and minerals) • Meat and fish (protein) • Milk and dairy (calcium) • Fats and sugars. It is important to eat the right amount of food from each group. We can measure food using portions.* •identify that humans and some other animals have skeletons and muscles for support, protection and movement. *Humans and many animals have skeletons to support their bodies and protect vital organs. Muscles are connected to bones and move them when they*	**Pupils should be taught to:** •describe the simple functions of the basic parts of the digestive system in humans; *The oesophagus is a muscular tube which moves food from the mouth to the stomach. The stomach is an organ in the digestive system where food is broken down with stomach acid and by being churned around. The small intestine is part of the intestine where nutrients are absorbed into the body. The large intestine is part of the intestine where water is absorbed from remaining waste food. Faeces* are formed in the large intestine •identify the different types of teeth in humans and their simple functions; *Incisors bites and cuts. Canines tears and rips. Molars grind and premolar hold and crushes. Some people have wisdom teeth but they have no function now* •construct and interpret a variety of food chains, identifying producers, predators and prey. *A producer is an organism, such as a plant, that produces its own food. A predator is an animal that hunts and eats other animals. Prey is an animal that gets hunted and eaten*	**Pupils should be taught to:** •describe the changes as humans develop to old age. *Prenatal – cells develop and grow into a foetus inside the mother's uterus. After around 9 months, the baby is born. Infancy – rapid growth and development. Children learn to walk and talk. Childhood – children learn new skills and become more independent. Adolescence – The body starts to change over a few years. The changes occur to enable reproduction during adulthood. Earl adulthood – the human body is at its peak of fitness and strength. Middle adulthood – ability to reproduce decreases. There may be hair loss or hair may turn grey. Late adulthood – leading a healthy lifestyle can help slow down the decline of fitness and health with occurs during this stage. irls – larynx (voice box grows), hair grows under armpits, skin becomes oilier, breasts grow, gain hair on arms and legs, start to menstruate, pubic hair grows. Boys – larynx (voice box) grows 'Adam's apple', hair grows on chest, pubic hair grows, skin becomes oilier, facial hair grows, hair under armpits grow, gain hair on arms and legs, scrotum, testes and penis develop, become more*	**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; *The heart is an organ which constantly pumps blood around the circulatory system. The heart pumps blood to the lungs to get oxygen. It then pumps this oxygenated blood around the body. Blood vessels are the tube-like structures that carry blood through the tissues and organs. Veins, arteries and capillaries are the three types of blood vessels. Oxygenated blood has more oxygen, it is pumped* from the heart to the rest of the body. Deoxygenated blood is blood where most of the oxygen has already been transferred. •recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function; *Drugs, alcohol and smoking have negative effects on the body. A healthy diet involves eating the right types of nutrients in the right amounts. Regular exercise strengthens muscles including the heart muscle, improves circulation,*

	animals (or meat) are called carnivores. Animals that eat only plants are called herbivores. •identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. *Our eyes help us to see. Our ears help us to hear. Our nose helps us to smell. Our hands help us to feel and our mouth/tongue helps us to taste.*		*contract. Movable joints connect bones*	*by another animal. An example of a food chain: grass (producer) (slug (prey) (frog (predator/ prey) (owl (predator) The arrows in a food chain show the flow of energy.*	*muscular. Both – grow taller, sweat glands produce more sweat, all parts of the body grow.*	*increases the amount of oxygen around the body, releases brain chemicals which help you feel calm and relaxed, helps you sleep more easily, and strengthens bones. It can even help to stop us from getting ill.* •describe the ways in which nutrients and water are transported within animals, including humans. *Nutrients are found in food and water, once broken down, the nutrients are absorbed into the blood in the small intestine. There are tiny hairlike villi that help this process happen. The nutrients are carried in the blood to the different parts of the body that need them. Water doesn't need breaking down and moves between membranes in the body to arrive in the correct place, again via our blood.*
Vocabulary Progression ***See White Rose Scheme for Key Vocab**	mammal amphibian reptile mammal birds fish pets meat common animals common carnivores herbivore omnivore diet sight hearing touch smell senses human pet body parts head arms elbows legs knees face ears eyes nose hair mouth teeth hands feet tail wings feathers fur beak fins gills light, dark, blind, loud, quiet noisy sweet, salty, sour, bitter, savoury skin	Mammal carnivore herbivore omnivore fur bird feathers beak insect insectivore scales gills fin offspring survival water -spawn-tadpole-frog grow air lamb-sheep adult exercise hygiene baby-toddler-child-teenager-adult nutrition reproduce egg-chick-chicken egg-caterpillar-pupa-butterfly off-spring, develop, patch, diet, food groups:	Nutrition, nutrients, muscles, tendons, skeletons, joints, bones, cartilage, vertebrate, invertebrate, skull spine, backbone, ribcage, pelvis, femur, contracting, relaxing, exoskeleton	Digestive system, teeth, saliva, stomach, liver, pancreas, gall bladder, small/ large intestine, rectum, anus, faeces, oesophagus, molar, pre molar, incisor, canine, wisdom, tooth decay, plaque	Gestation, asexual reproduction, sexual reproduction, embryo, foetus, uterus, prenatal, adolescence, puberty, adulthood, life expectancy, old age, hormones, sweat,	Circulatory system, heart, blood vessels, blood, circulation, pulse, heartbeat, heart rate, lungs, breathing, pump, transported, oxygenated blood, deoxygenated blood, carbon dioxide, oxygen, arteries, veins, capillaries, chambers, plasma, platelets, red and white blood cells, drug, alcohol, smoking, disease, calorie, energy input and output, water transportation, nutrient transportation and waste products.

	rough smooth hard soft smell					

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants *Prior Sticky Knowledge EYFS: I have experienced growing a plant and can explain what a plant needs to grow. I can label key parts of a plant.	**Pupils should be taught to:** •identify and name a variety of common wild and garden plants, including deciduous and evergreen trees; *A wild plant seed grows where it falls. It doesn't need to be planted or cared for as it grows. Garden plants are plants that people choose to grow in their gardens. A deciduous tree loses its leaves each year. An evergreen tree keeps its green leaves all year round, even in the winter.* •identify and describe the basic structure of a variety of common flowering plants, including trees. *Roots take in water and nutrients from the soil and keep the plant in the ground. The stem holds the plant up and carries the water and nutrients*	**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. *Plants are living things that use sunlight to make their own food. Every plant needs water to grow and survive. Plants need sunlight to grow well. All plants need the right temperature to grow well. Seeds and bulbs can germinate and sprout underground without sunlight because they have a store of food inside the bulb/seed.*	**Pupils should be taught to:** •identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers; *Plants are producers, they make their own food Roots take in water and nutrients from the soil and keep the plant in the ground. The stem holds the plant up and carries the water and nutrients from the roots to the leaves and flowers. Leaves absorb sunlight and carbon dioxide to help the plant to make its own food. Flowers attract insects and birds.* •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; *Plants need: water, light, nutrients from the soil, air and room to grow. Different plants vary in how much of these things they need e.g. cacti can survive in*			

	from the roots to the leaves and flowers. Leaves catch sunlight to help the plant to make its own food. Flowers attract insects and birds. Petals are the colourful part of a flower. Fruit contains the plant's seeds. Seeds and bulbs grow into new plants.		*areas with little water, whereas water lilies need to live in water. Seeds/bulbs require the right conditions to germinate and grow. Seeds contain enough food for the plant's initial growth.* •investigate the way in which water is transported within plants; *1.The roots absorb water from the soil. 2.The stem transports water to the leaves. 3.Water evaporates from the leaves. 4.This evaporation causes more water to be sucked up the stem* •explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. *Flowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed production. Seed dispersal improves a plants chances of successful reproduction. Seed dispersal – the fully formed seeds are moved away from the parent plant. Germination – The seed starts to grow. Growing and flowering – The plant grows bigger and forms a flower. Pollination – pollen from the anther lands on the stigma and travels down the style. Fertilisation and seed formation – the pollen joins with an ovule and a seed starts to form*.			

Vocabulary Progression ***See White Rose Scheme for Key Vocab**	seasons Spring change weather plant tree vegetables fruit garden wild (plants) evergreen deciduous weed grass flower berry leaf(ves) petal stem trunk branch root seed bulb soil	Flower, leaves, petals, fruit, roots, bulb, seed, trunk, branches, stem, microhabitat, water, light, temperature, healthy, sunlight, germination, seed dispersal, life cycle, compost, seed, vegetable, herb	Root, stem, trunk, leaves, sun, transported, evaporation, evaporate, nutrients, pollen, pollination, seed dispersal, fertilisation, stamen, anther, sepal, stigma, carbon dioxide, oxygen			

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Living Things And Their Habitats *Prior sticky knowledge EYFS: I understand the need to respect and care for the natural environment and all living things.		**Pupils should be taught to:** •explore and compare the differences between things that are living, dead, and things that have never been alive; *Everything is either living, dead or has never been alive. There are 7 characteristics of living things: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition. These can be remembered using the acronym: MRS GREN*. •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; *Different habitats are suited to different plants and animals i.e. forest, ocean, desert, woodland. Habitats*		**Pupils should be taught to:** •explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment; •recognise that living things can be grouped in a variety of ways; *Living things can be divided into groups based upon their characteristics e.g. vertebrate animals can be put into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses.*	**Pupils should be taught to:** •describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird; *A lifecycle is the journey of changes that take place throughout the life of a living thing including birth, growing up and reproduction. The life cycle of a frog (amphibian) • Egg • Tadpole • Tadpole with legs • Young frog • Adult* •describe the life process of reproduction in some plants and animals. *Humans develop inside their mothers and are dependent on their parents for many years until they are old enough to look after themselves. Amphibians such as frogs are laid in eggs then, once hatched, go through many changes until they become an adult. Some animals, such as butterflies*	**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; *Broad groupings, such as micro-organisms, plants and animals can be subdivided. Animals can be classified into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals).* •give reasons for classifying plants and animals based on specific characteristics. *A classification key is a set of questions about the characteristics of living things. A classification key helps to identify a living thing*

		provide for the basic needs of the animals and plants that live there, such as food and shelter •identify and name a variety of plants and animals in their habitats, including microhabitats; *Mammals, reptiles, amphibians, birds and fish can be found in habitats which are suited to them. Microhabitats are small habitats where mini beasts may live (e.g. under a rock, under leaves).* •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. *A food chain shows how animals get food from plants and other animals. There are different sources of food e.g. crops, plants, trees, meat and milk from animals. Living things depend on each other to survive.*		•recognise that environments can change and that this can sometimes pose dangers to living things. *Environmental change affects different habitats differently. Different organisms are affected differently by environmental change. Human activity significantly affects the environment. Positive impacts - the positive effects of nature reserves, ecologically planned parks, or garden ponds. Negative impacts – negative effects of population and development, litter or deforestation.*	*go through metamorphosis to become an adult. Birds are hatched from eggs and are looked after by their parents until they are able to live independently*	*or decide which group it belongs to by answering questions. Variation exists within a population (and between offspring of some plants) – NB: this key idea is duplicated in Year 6 Evolution and Inheritance. Organisms best suited to their environment are more likely to survive long enough to reproduce. Organisms are best adapted to reproduce are more likely to do so. Organisms reproduce and offspring have similar characteristic patterns.*
Vocabulary Progression ***See White Rose Scheme for Key Vocab**		Living, dead, shelter, food chain, growth, reproduction, nutrition, minibeast, carnivore, herbivore, omnivore, predator, prey, producer, consumer,		Vertebrates, Mammals, fish, reptiles, amphibians, birds invertebrates, spiders, snails, flowering and non flowering plants environment. Deforestation, climate, population	Asexual reproduction, sexual reproduction, gestation, metamorphosis, tuber, runners/side branches, plantlet, cuttings, embryo, adolescent, life cycle, pollination, offspring, fertilise, fertilisation, sepal, filament, anther, stamen, pollen, petal, stigma, style, ovary, carpel,	Carl Linneaeus, Linnaean system, flowering and non-flowering plants, variation, microorganisms, bacteria, single-celled, microbes, microscopic, virus, fungi, fungus, mould, antibiotic, yeast, ferment, microscope and decompose.

					ovule, stem, bulb, roots, mammal, live young	

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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; *Evolution is the process by which living things gradually change over time. Fossils provide information about living things from 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; *Organisms reproduce and offspring have similar characteristic patterns.* •identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. *Over time the characteristics that are most suited to the environment become increasingly common. Organisms best suited to their environment are more likely to survive long enough to reproduce. Variation exists within a population (and between offspring of some plants).*
Vocabulary Progression ***See White Rose Scheme for Key Vocab**						evolve, adaptation, inherit, natural selection, adaptive traits, inherited traits, mutations, theory of evolution, ancestors, biological parent, chromosomes, genes, Charles Darwin. selective breeding, artificial selection, breed, cross breeding, genetically modified food, cloning, DNA. Previously introduced vocabulary: classification, offspring, characteristics, habitat, environment, adapt, variations, human, fossil, suited, cells, names of different habitats, names of animals and their body parts, species, sedimentary rock, lava, igneous rock.

						metamorphic rock, magma, heat, fossilisation.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasonal Changes *Prior sticky knowledge EYFS: I can name the four seasons and describe the changes throughout each season.	**Pupils should be taught to:** •observe changes across the 4 seasons; *There are four seasons: Spring, Summer, Autumn, Winter. There are lots of different types of weather: rain, sun,*					

	cloud, wind, snow, etc. •observe and describe weather associated with the seasons and how day length varies. *Days are longer and hotter in the summer. Days are shorter and colder in the winter.*					
Vocabulary Progression ***See White Rose Scheme for Key Vocab**	Spring summer autumn winter seasons night day daylight weather sun rain snow sleet frost ice fog cloud hot/warm cold storm wind thunder forecast temperature rainfall thermometer rain gauge months change hibernate migrate					

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Forces			Forces and Magnets **Pupils should be taught to:** •compare how things move on different surfaces; *Different surfaces create different amounts of friction. The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object, and the force between them* •notice that some forces need contact between 2 objects, but magnetic forces can act at a distance; *A force that acts between two surfaces or objects that are*		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; *Gravity is a pulling force exerted by the Earth (or anything else which has mass).Earth's gravitational pull is the pull that Earth exerts on an object, pulling it towards Earth's centre. It is the Earth's gravitational pull which keeps us on the ground. Unsupported objects fall towards the Earth because of the force of*	

			moving, or trying to move, across each other. Magnetic force can act at distance. •observe how magnets attract or repel each other and attract some materials and not others; *Magnets produces a magnetic force that pulls certain objects towards it. Objects which are attracted to a magnet are magnetic. Objects containing iron, nickel or cobalt metals are magnetic.* •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; *Objects which are attracted to a magnet are magnetic. Objects containing iron, nickel or cobalt metals are magnetic*. •describe magnets as having 2 poles; *North and south poles are found at different ends of a magnet* •predict whether 2 magnets will attract or repel each other, depending on which poles are facing. *Repulsion is a force that pushes objects away. For example, when a north pole is placed near the north pole of another magnet, the two poles repel (push away from each other).*		*gravity acting between the Earth and the falling object.* •identify the effects of air resistance, water resistance and friction, that act between moving surfaces; *Air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way. Friction is a force against motion caused by two surfaces rubbing against each other.* •recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. *Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move*	

Vocabulary Progression ***See White Rose Scheme for Key Vocab**			forces, surface, push, pull, friction, magnet, magnetic, magnetic field, poles, repel attract		Air resistance, water resistance, buoyancy, upthrust, Earth's gravitational pull, gravity, opposing forces, driving force, weight, mass, kilograms (kg), Newtons (N), scales. Speed, fast, slow, streamlined, water resistance, repeatability Mechanisms: levers, pulleys, gears/cogs	

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Light			**Pupils should be taught to:** •recognise that they need light in order to see things and that dark is the absence of light; *There must be light for us to see. Without light it is dark. We need light to see things even shiny things.* •notice that light is reflected from surfaces; *Beams of light*			**Pupils should be taught to:** •recognise that light appears to travel in straight lines; *Light travels 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; *Light from the sun travels in a straight line and hits an object. The light ray is then reflected off the objects and*

			bounce off some materials (reflection). •recognise that light from the sun can be dangerous and that there are ways to protect their eyes; *The pupils control the amount of light entering the eyes. If too much light enters, then it can damage the retina. To help protect the eyes, you can wear a hat with a wide brim and sunglasses with a UV rating.* •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. *A shadow is caused when light is blocked by an opaque object. A shadow is larger when an object is closer to the light source. This is because it blocks more of the light.*			*travels in a straight line to our eyes, enabling us to see the object.* •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; *We need light to be able to see things. Light waves travel out from sources of light in straight lines. These lines are often called rays or beams of light.* •use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. *A shadow is always the same shape as the object that casts it. This is because when an opaque object is in the path of light travelling from a light source, it will block the light rays that hit it, while the rest of the light can continue travelling*
Vocabulary Progression ***See White Rose Scheme for Key Vocab**			Light, dark, light source, shadow, translucent, opaque, transparent, reflection, UV light, UV rating			Reflection, periscope, visible spectrum, prism, light waves, wavelength, straight line, refraction.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Sound				**Pupils should be taught to:** •identify how sounds are made, associating some of them with something vibrating; *Sound is a type of energy. Sounds are created by vibrations. The louder the sound, the bigger the vibration.*		

				•recognise that vibrations from sounds travel through a medium to the ear; *Inside your ear, the vibrations hit the eardrum and are then passed to the middle and then the inner ear. They are then changed into electrical signals and sent to your brain. Your brain tells you that you are hearing a sound.* •find patterns between the pitch of a sound and features of the object that produced it; *Pitch is a measure of how high or low a sound is. A whistle being blown creates a high-pitched sound. A rumble of thunder is an example of a low-pitched sound.* •find patterns between the volume of a sound and the strength of the vibrations that produced it; *The size of the vibration is called the amplitude. Louder sounds have a larger amplitude, and quieter sounds have a smaller amplitude* •recognise that sounds get fainter as the distance from the sound source increases. *When sound vibrations spread out over a distance, the sound becomes quieter, just like ripples in a pond*		

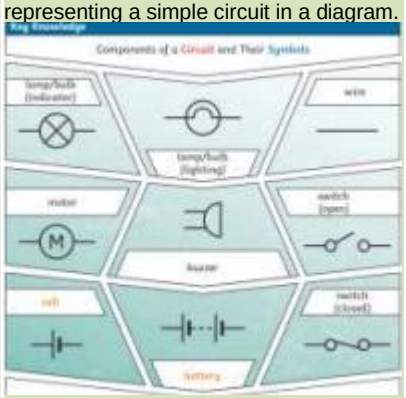
Vocabulary Progression ***See White Rose Scheme for Key Vocab**				Vibrations, pitch, volume, instruments, sound proofing, ear eardrum, vocal chords, sound waves, travel, distance, quiet, loud, high, low, amplitude, absorb		

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

Earth and Space					**Pupils should be taught to:** •describe the movement of the Moon relative to the Earth; *The Moon orbits Earth in an oval- shaped path while spinning on its axis. At various times in a month, the Moon appears to be different shapes. This is because as the Moon rotates round Earth, the Sun lights up different parts of it.* •describe the movement of the Earth and other planets relative to the Sun in the solar system; •use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. *Earth rotates (spins) on its axis. It does a full rotation once in every 24 hours. At the same time that Earth is rotating, it is also orbiting (revolving) around the Sun. It takes a little more than 365 days to orbit the Sun. Daytime occurs when the side of Earth is facing towards the Sun. Night occurs when the side of Earth is facing away from the Sun.* •describe the Sun, Earth and Moon as approximately spherical bodies; *The sun, moon and the Earth are astronomical objects shapes like spheres.*	

Vocabulary Progression ***See White Rose Scheme for Key Vocab**					Solar system, star, planet, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus, spherical bodies, sphere Rotate, axis, orbit, satellite Geocentric model, heliocentric model, astronomer Sunrise, sunset, midday, time zone, sun, moon, shadow, light, day, night, heat, reflect	

Fairfield Road Primary School
Science PoS Progression

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electricity				**Pupils should be taught to:** •identify common appliances that run on electricity; *A source of electricity (mains or battery) is needed for electrical devices to work* •construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers; *Electricity sources push electricity round a circuit. Electricity can only flow around a complete circuit that has no gaps. There must be wires connected to both the positive and negative end of the power supply/battery.* •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; *Electricity can only flow around a complete circuit that has no gaps. There must be wires connected to both the positive and negative end of the power supply/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;		**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; *More batteries or a higher voltage create more power to flow through the circuit. Shortening the wires means the electrons have less resistance to flow through.* •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; *Fewer batteries or a lower voltage give less power to the circuit. More buzzers or bulbs mean the power is shared by more components. Lengthening the wires means the electrons have to travel through more resistance.* •use recognised symbols when representing a simple circuit in a diagram. 

				Switches can be used to open or close a circuit. When off, a switch 'breaks' the circuit to stop the flow of electricity. When on, a switch 'completes' the circuit and allows the electricity to flow. •recognise some common conductors and insulators, and associate metals with being good conductors. *A conductor of electricity is a material that will allow electricity to flow through it. Metals are good conductors. Materials that are electrical insulators do not allow electricity to flow through them. Wood, plastic and glass are good insulators.*		
Vocabulary Progression ***See White Rose Scheme for Key Vocab**				Circuit, cell, battery, battery, wires, lamps, complete/ incomplete, switches, conductors/ insulators, renewable fuels, fossil fuels, appliances, mains, AC/DC,		voltage, amps, resistance, electrons, volts (V), current, symbol, circuit diagram, component, function, filament, dimmer, brighter, louder, quieter, natural electricity, human-made electricity, solar panels, power station, positive, negative.

Fairfield Road Primary School
Science PoS Progression

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Materials *Prior Sticky Knowledge EYFS: I can find similarities, differences, patterns and change.	Everyday Materials **Pupils should be taught to:** •distinguish between an object and the material from which it is made; *Objects are things that you can touch or see. Objects are made from different materials. Objects feel and look different based on the material they are made from* •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 their simple physical properties. *Some materials that objects are made from are: glass, wood, paper, metal, water, rock and plastic. Some words to describe materials are: shiny, soft, rough, bendy, hard and absorbent.*	Use of Everyday Materials **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; *Suitability means having the properties which are right for a specific purpose, e.g. metal, wood and plastic are all suitable materials for spoons.* •find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. *Materials can be changed by physical force.*	Rocks **Pupils should be taught to:** •compare and group together different kinds of rocks on the basis of their appearance and simple physical properties; *Igneous rock is rock that has been formed from magma or lava. Sedimentary rock is rock that has been formed by layers of sediment being pressed down hard and sticking together, you can see the layers of sediment in the rock. Metamorphic rock is rock that started out as igneous or sedimentary rock but changed due to being exposed to extreme heat or pressure.* •describe in simple terms how fossils are formed when things that have lived are trapped within rock; *More layers of rock cover it. Only hard parts of the creature remain, e.g. bones, shells and teeth. Over thousands of years, sediment might enter the mould to make a cast fossil. Bones may change to mineral but will stay the same shape. Changes in sea level take place over a long period. As erosion and weathering take place, eventually the fossil becomes exposed.* •recognise that soils are made from rocks and organic matter. *Soil is the uppermost layer of the Earth. It is a mixture of different things;*	States of Matter **Pupils should be taught to:** •compare and group materials together, according to whether they are solids, liquids or gases; *Solids, liquids and gases are described by observable properties. Particles in a solid are close together and cannot move. They can only vibrate. Particles in a liquid are close together but can move around each other easily. Particles in a gas are spread out and can move around very quickly in all directions.* •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); *Heating causes solids to melt into liquids and liquids evaporate into gases. Cooling causes gases to condense into liquids and liquids to freeze into solids. When water and other liquids reach a certain temperature, they change state into a solid or a gas. The temperatures that these changes happen at are called the boiling, melting or freezing point.* •identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. *Condensation and evaporation occur within*	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; *Different materials are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity, transparency.* •know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution; *A solution is made when solid particles are mixed with liquid particles. Materials that will dissolve are known as soluble. Materials that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve.* •use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating; *Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by: Sieving - Smaller materials are able to fall through the holes in the sieve, separating them from larger particles*	

			minerals (the minerals in soil come from finely broken-down rock), air, water, organic matter (including living and dead plants and animals).	*the water cycle. 1. Water from lakes, puddles, rivers and seas is evaporated by the sun's heat, turning it into water vapour. 2. This water vapour rises, then cools down to form water droplets in clouds (condensation). 3. When the droplets get too heavy, they fall back to the earth as rain, sleet, hail or snow (precipitation).*	*Filtering - The solid particles will get caught in the filter paper but the liquid will be able to get through Evaporating -The liquid changes into a gas, leaving the solid particles behind.* •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; *Some changes can be reversed, and some cannot.* •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. *Irreversible changes often result in a new product being made from the old materials (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic.*	

Vocabulary Progression ***See White Rose Scheme for Key Vocab**	Materials wood plastic glass metal water rock paper cardboard rubber fabric properties hard soft shiny dull stretchy rough smooth bendy transparent opaque waterproof absorbent object	Materials wood plastic glass metal water rock paper cardboard rubber fabric properties hard soft shiny dull stretchy rough smooth bendy transparent opaque waterproof absorbent object bending twisting squashing, solid, strong flexible recycle pollution	rocks, fossils, igneous, metamorphic, sedimentary, permeable, impermeable, magma, lava, sediment, erosion, fossilisation, appearance, organic matter, humus, topsoil, subsoil, bedrock	Solid, liquid , gas, particles, vibration, evaporate, condense, melt, freeze, melting point/ freezing point/ boiling point, water cycles, precipitation, collection, water droplets, hail, rain, sea, stream, river, atmosphere, temperature, snow, wind, carbon dioxide,	Thermal, conductor, insulator, magnetism, electrical resistance, transparency, mixtures, solutions, dissolving, substance, soluble, insoluble, solute Reversible change, physical change, irreversible change, chemical change, burning, new material, product Sieving, filtering, magnetic attraction Previously introduced: Electrical conductor/insulator, bulb, transluscent	

Fairfield Road Primary School
Science PoS Progression

	EYFS	KS1	LKS2	UKS2
Working Scientifically	• asking simple questions and recognising that they can be answered in different ways; identifying and classifying. • using their observations and ideas to suggest answers to questions. • observing closely, using simple equipment; identifying and classifying.	• 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	• 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, 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.	• 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 displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments

Vocabulary Progression		aim answers block diagrams changes compare describe difference different enquiry equipment experience explore findings gather group identify (name) Investigate label measure notice observe organise patterns pictograms questions record same similarity simple tables sort sorting diagrams tally charts test What will we do? (plan) What do you think will happen? (prediction) What happened? (results) What have we found out? (conclusion)	accurate bar chart chart classify comparative test conclusion (What have we found out?) criteria data develop diagram evaluate evidence explanation key making a test fair method observations plan (What will we do?) practical enquiry prediction (What do you think will happen?) primary sources questioning reasoning relationships results (What happened?) secondary sources standard units table What do we change, what do we keep the same, what are we measuring?	accuracy and precision bar graphs causal relationship degree of trust dependent variable independent variable controlled variable justify line graphs refute repeat results scatter graphs support variables (what do we change, what do we keep the same, how and what are we measuring?)