



Features		
<ul style="list-style-type: none"> • At Early Years, the key knowledge progression document takes reference from the; Early Years Framework and Development Matters. • At KS1, the key knowledge is aligned with the National Curriculum and at Nields Academy the following strands feature within our curriculum: • At KS2, the key knowledge is aligned with the National Curriculum’s strands of: <ul style="list-style-type: none"> • Assessment • Developing Experts Knowledge Organisers • Retrieval Challenge Grids 	<div style="margin-bottom: 20px;">  <p>Skills are reliant upon specific knowledge. A skill is the capacity to perform from drawing upon retained knowledge.</p> </div> <div>  <p>Children are taught specific vocabulary in line with their topic and the Statutory Spellings of their year group.</p> </div>	
Early Years Framework		
Strand	Early Years Statutory Framework: Understanding of the World	Development Matters:
Early Years	<ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know similarities and differences between the natural world around them and contrasting environments. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. 	<ul style="list-style-type: none"> • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them. • Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about what they see, using a wide vocabulary. • Plant seeds and care for growing plants. • Understand the need to respect and care for the natural environment and all living things. • Explore and talk about the different forces they can feel. • Talk about the differences between materials and changes they notice.

National Curriculum													
Strand													
NC Strand	Living things and their habitats	Plants	States of Matter	Materials	Electricity	Seasonal changes	Earth and Space	Rocks	Sound	Working Scientifically	Light	Forces and Magnets	
Our science concepts	Working Scientifically		Animals inc humans	Forces	Plants		States of Matter	Living things and their habitats		Materials	Energy	Earth Science	
Sticky facts threading through our science curriculum strands													
Strand	Nursery	Reception	Year 1 Year 2		Year 3 Year 4		Year 5 Year 6						
Materials	To choose equipment to help me follow my own enquiry of interest. Explore separating materials using sieves. Explore mixing materials. Talk about found objects. I can explore different objects by shaking, pulling and feeling. I can explore melting ice.		Objects are made from different materials because of their different properties. Different materials have different properties. I can name a variety of materials such as wood, plastic, glass, metal, water and rock. Materials are the stuff things are made from. Materials that are man-made are concrete, glass and rubber. Materials that are natural are chalk, sand and gold. Straw is a bendy material and wood and clay are strong materials. Slate is waterproof and is used to keep houses dry. Absorbent materials such as fabric soak up water. Glass is transparent which means that you can see through it. A material is brittle when it can break easily. A material that you cannot see light through is opaque. Plastic can be moulded or shaped to form things like buckets. I will know that most furniture is made		Matter makes up our planet and the whole universe. On Earth, all matter exists in one of three main states: solid, liquid or gas. A solid can hold its shape (for example, water in solid form is ice). A liquid like water forms a pool: it flows or runs but it can't be stretched or squeezed. A gas can flow, expand and be squeezed; if it is in an unsealed container it escapes (water in gas form is steam). Depending on its temperature, matter can change state; heating, cooling, evaporating and condensation are ways in which a material changes state Melting is the process of changing a solid into a liquid. Evaporation is the process of changing a liquid into a gas. Condensation is the process of changing a gas into a liquid. Freezing is the process of changing a liquid into a solid.						Materials that dissolve in water are called soluble. An example is sugar. Solids that do not dissolve in water are called insoluble. An example is sand. Metal saucepans conduct heat to warm food. Wooden spoons and plastic handles insulate heat, so hands do not get burned. Irreversible changes cannot be undone. For example, when a material is burnt. Reversible changes, like melting, freezing and dissolving, can be changed back again. Some mixtures can be separated by methods like filtering, sieving and evaporating. Materials that are very hard are difficult to bend or scratch. Iron is one of the hardest materials.		

		<p>from wood. Doors are made from wood.</p> <p>Glass is used for windows in houses and cars to see through. Glass is used for mirrors, to see your reflection.</p> <p>Clothes are made from materials like leather, wool, cotton and silk. Wool is used for jumpers.</p> <p>A waterproof material does not allow water or liquid through.</p> <p>Materials are what something is made of. For example, plastic or metal.</p>		
<p>Animals inc Humans</p>	<p>I can name the parts of my body.</p> <p>I can observe the features of animals.</p> <p>I can explain the effect of exercise on my body.</p> <p>I can explain how to keep myself safe in the sun.</p> <p>I know what healthy food choices are.</p>	<p>The basic needs for survival for animals including humans are water, food and air.</p> <p>Animals can be divided into five distinct groups: mammals, fish, birds, reptiles and amphibians.</p> <p>Animals have offspring that grow into adults.</p> <p>Humans have five senses: smell, taste, sight, hearing and touch.</p> <p>Humans need a healthy diet, good hygiene and they need to exercise to stay healthy.</p> <p>Life Cycles</p> <p>The five main stages of a human's life are baby, child, teenager, adult and old age.</p> <p>Before a baby is born, it is called a foetus.</p> <p>Offspring inherit features from their parents, for example eye colour.</p> <p>Reproduction is the process of producing offspring.</p>	<p>The five key food groups are; protein, carbohydrate, mineral, fatty acid and vitamin.</p> <p>Carbohydrates are broken down by our body to provide it with the energy to move and exercise.</p> <p>Vitamin D is found in milk, cheese and fish and helps bone development.</p> <p>Vitamin C is in oranges and tomatoes and prevents infection.</p> <p>Skeletons keep the body in shape, help movement and protect organs.</p> <p>All mammals, birds, amphibians, reptiles and fish have an endoskeleton. This is a skeleton on the inside of the body.</p> <p>There are two different types of muscles in our body; voluntary and involuntary muscles. Involuntary muscles work all the time such as the heart.</p> <p>TEETH</p> <p>Humans have 4 different types of teeth. Incisors cut food, canines tear food, pre-molars crush food, and molars grind food. Humans are omnivores, which means we eat a mixed diet of plants and meat – this is why our teeth are designed and laid out in our mouths the way they are.</p> <p>Teeth are made of two main parts: the crown (the bit you can see) and the root (the bit inside your gum that holds your tooth in place).</p>	<p>Humans develop inside their mothers and are dependent on their parents for many years until they are old enough to look after themselves.</p> <p>Amphibians such as frogs are laid in eggs then, once hatched, go through many changes until they become an adult.</p> <p>Some animals, such as butterflies, go through metamorphosis to become an adult.</p> <p>Birds are hatched from eggs and are looked after by their parents until they are able to live independently.</p> <p>Some plants, such as strawberry plants, potatoes, spider plants and daffodils use asexual reproduction to create a new plant. They are identical to the parent plant.</p> <p>Some living things, such as plants, contain both the male and female sex cells. In others, such as humans, they contain either the male or female sex cell.</p> <p>0-3 years of life are the most important for brain development.</p> <p>A mother gives birth at approximately nine months.</p> <p>Puberty begins in girls on average at 11 years of age and 12 years of age for boys.</p> <p>During puberty, girls develop breasts and start their periods and boys develop a deeper voice and grow facial hair.</p> <p>The larger a mammal the greater the gestation period (with the exception of humans).</p> <p>A human's average life expectancy is approximately 80 years in the UK.</p> <p>The circulatory system includes the heart, blood and blood vessels and is vital for fighting disease.</p> <p>It is important to keep your heart healthy with a well-balanced diet and exercise, and avoid things that can damage it such as smoking.</p> <p>Arteries are blood vessels which move oxygenated blood away from the heart.</p>

			<p>A tooth is made of four different substances: enamel, dentine, pulp and cementum.</p> <p>The enamel is the bit on the outside of your tooth (it is very hard), while the dentine and pulp are found inside the tooth.</p> <p>The pulp contains the nerves and blood vessels of the tooth.</p> <p>Cementum is the substance at the bottom of the tooth root which helps to anchor it into the jaw bone.</p> <p>DIGESTIVE SYSTEM</p> <p>The human digestive system is made up of organs and glands that process food. To use the food we eat as energy, our body has to break the food down into smaller molecules that it can process; it also has to excrete (or get rid of) waste. Most of the digestive organs (like the stomach and intestines) are tube-like and contain the food as it makes its way through the body.</p> <p>The digestive system is essentially a long, twisting tube that runs from the mouth to the anus, plus a few other organs (like the liver and pancreas) that produce or store digestive chemicals.</p> <p>Without the digestive system, our bodies would not be able to get nutrients from the food we eat or get rid of the waste products that food makes and we would soon become ill!</p> <p>A food chain shows us how plants and animals within a habitat rely on each other for food.</p> <p>Food chains usually start with a green plant (a producer) which is eaten by an animal (a consumer/prey), which is then eaten by another animal (predator)</p>	<p>Veins are blood vessels that carry blood back to the heart. Blood carries almost everything in the body, transporting hormones, oxygen, nutrients and antibodies.</p> <p>Evolution and Inheritance</p> <p>A characteristic is a feature or something that helps describe how it looks or what it can do.</p> <p>Animals adapt to live in their habitats, for example camels (who are found in deserts) have humps that store rich fat and nutrition.</p> <p>Plants also adapt to live in their habitats, for example Venus fly traps release a scent to attract flies that they then trap.</p> <p>Palaeontologist's study remains of plants and animals found as fossils. Charles Darwin is best known for his theory of evolution.</p>
<p>Forces and Magnets</p>			<p>The ends of magnets have two poles; the north and the south. Opposite poles attract similar poles repel.</p> <p>A magnet is a material or object that produces a magnetic field.</p>	<p>Mass is how much matter is inside an object. It is measured in kilograms (kg).</p> <p>Weight is how strong gravity is pulling an object down. It is measured in Newtons (N).</p> <p>Water resistance and air resistance are types of friction.</p>

			<p>Friction is a force that holds back the motion of an object. The force that causes the object to move downwards is gravity.</p> <p>A force can be a push or a pull action that is caused by two objects touching each other. These are known as contact forces. A non-contact force draws magnetic items towards it.</p> <p>Magnets can be used to separate different types of metals. Magnets are used in compasses.</p>	<p>Pulleys are used to make a small force lift a heavier load.</p> <p>The more wheels in a pulley, the less force is needed to lift a weight.</p> <p>Gears and cogs can be used to change the speed, force or direction of a motion.</p> <p>Levers can be used to make a small force lift a heavier load. A lever always rests on a pivot.</p>
Earth Science	<p>I can describe what to wear in the different seasons.</p> <p>I can explore space.</p>	<p>There are four seasons: spring, summer, autumn and winter.</p> <p>Animals behave in different ways in each season.</p> <p>The length of the day is longer in the Summer and shorter in the Winter. This is because the Earth is tilted towards the sun in summer and away from the sun in winter.</p> <p>We have seasons because the Earth moves around the sun.</p> <p>Plants and trees change over the seasons.</p> <p>The weather in each season is different</p> <p>The temperature is warmer in the summer and colder in the winter. This is because the Earth is tilted towards the sun in summer and away from the sun in winter.</p> <p>We wear different clothes and take part in different activities in each season as the weather is different</p>		<p>It takes a year for the Earth to orbit the sun. The moon takes 28 days to orbit the Earth.</p> <p>The sun is a star at the centre of our solar system. It is made of hot gas.</p> <p>The Earth, Sun and Moon are spherical are different sizes.</p> <p>The sun's rays hit the side of the Earth which faces the sun. This causes day and night. The Earth spins on its axis once in 24 hours.</p> <p>That we only see part of the Moon that is lit by the Sun which is why it appears to be different shapes at different times of the month.</p> <p>Looking After Our Environment</p> <p>Climate is the average weather conditions over a long period of time.</p> <p>It takes a plastic bag 200—500 years to biodegrade.</p> <p>The UK is aiming to reach net zero by 2050.</p> <p>Burning most substances can produce greenhouse gases such as carbon dioxide.</p>
Electricity			<p>Many everyday appliances rely on electricity for them to work.</p> <p>Some appliances use mains electricity (are plugged into a socket) and others have a battery to make them work.</p> <p>A circuit where the components are connected in a loop.</p> <p>Electricity flows through each component in a single pathway.</p>	<p>When a light is switched on, you are sending a flow of electrons around the circuit.</p> <p>Metals such as copper, aluminium, zinc and gold are good conductors of electricity.</p> <p>Electricity is a type of energy that builds up in one place (static), or flows from one place to another- current electricity.</p> <p>A circuit that has only one route for the current to take is a series circuit. If more bulbs or buzzers are added, the power has to be shares and so they will be dimmer or quieter.</p> <p>If one part of the circuit breaks, the circuit is broken the flow of current stops.</p>

			<p>If there is a break in the circuit, that prevents the electricity from flowing, the components will not work. 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. Two or more cells joined together form a battery. Materials can be tested in a series circuit to see if they are conductors or insulators.</p>	
<p>Living things and their habitats</p>	<p>I can explain the lifecycle of a butterfly and some mini beasts.</p>	<p>There are five groups of animals called fish, amphibians, reptiles, birds and mammals. A dolphin is a mammal, a snake is a reptile, an eagle is a bird, a frog is an amphibian and a shark is a fish. Birds and mammals are warm-blooded. Mammals can live on land and in water. Birds lay eggs. Amphibians are cold-blooded. Fish live in water and have fins and reptiles live on land and have scales. Herbivores only eat plants, a carnivore eats other animals and an omnivore eats meat and plants. Animals are wild and some are kept as pets. Habitats are the places where plants and animals live. A food chain shows how energy is passed between plants and animals. All food chains include a producer.</p> <p>Habitats are the places where plants and animals live. Rainforests are tropical areas that receive lots of rain. A variety of plants and animals can live in a habitat. The Artic is in the northern polar region and the Antarctic is in the south pole.</p>	<p>Plants and animals survive using their environment to give them everything they need. When habitats change, it can be very dangerous to the plants and animals that live there. Changes to an environment can be natural or caused by humans. Changes to an environment can have good and bad effects. Animals can be grouped in lots of different ways based upon their characteristics. You can use classification keys to help group, identify and name a variety of living things.</p>	<p>Living things can be classified into eight categories and the number of living things in each level gets smaller until the one animal is left in its species. Microorganisms are viruses, bacteria, moulds, and yeast. Some animals (dust mites) and plants (plankton) are also microorganisms. Microorganisms are very tiny living things that can only be seen using a microscope. They can be found in and on our bodies, in the air, in water and on objects around us.</p>

<p>Plants</p>	<p>I can plant seeds, including sunflower and grass seeds. I can explore autumn leaves.</p>	<p>Plants need light, water and warmth to grow. Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them. Plants and trees are similar, but a tree has a trunk and a plant has a stem. The roots anchor the plant and tree in the ground and absorb water to help it grow.</p>	<p>Plants are producers, they make their own food. Their leaves absorb sunlight and carbon dioxide. Plants have roots, which provide support and draw water from the soil. Flowering plants have specific adaptations, which help it to carry out pollination, fertilisation and seed production. Seed dispersal improves a plant's chances of successful reproduction. Seeds/bulbs require the right conditions to germinate and grow. Seeds contain enough food for the plant's initial growth Transpiration: the roots absorb water, which then moves up the stem from the soil.</p>	
<p>Rocks</p>			<p>There are 3 different types of rocks; igneous, sedimentary and metamorphic. Igneous rock is formed when magma or lava from volcanoes cools. Examples include basalt and granite. Sedimentary rocks are formed over millions of years when sediments (tiny pieces of rocks and animal skeletons) are pressed together at the bottom of seas and rivers. Examples include sandstone, coal and chalk. Some sedimentary rocks contain fossils (bones or shells of living things that were buried long ago and have turned to stone). Metamorphic rocks are formed when other rocks are changed due to heat or pressure. Examples include slate and marble. Metamorphic rocks are very hard but can be damaged by acids like acid rain (on buildings) or even lemon juice. Fossils are the remains of once-living plants or animals, preserved in rocks. Soils are made from rocks and organic matter.</p>	

Sound			<p>When objects vibrate, a sound is made. The vibration makes air around an object vibrate and the vibrations travel into your ear. These are called sound waves. The louder the sound, the bigger the vibration.</p> <p>If an object is making a sound, a part of it is vibrating.</p> <p>Sounds can travel through objects. When travelling through water, sound moves four times faster than when it travels through the air. Sound can also be blocked.</p> <p>Volume is measured in decibels. Faster vibrations produce higher pitched sounds. These are called higher frequencies.</p> <p>Changing the shape, size and material of an object will change the sound it produces.</p>	
Light			<p>Reflection is how we use light to see around us.</p> <p>Reflection is when light hits the surface of an object and then that light travels to our eyes so we can see.</p> <p>Smooth surfaces such as mirrors, water and some metals reflect the most light which is why they appear shiny.</p> <p>The moon reflects sunlight so we can see it shining brightly in the sky.</p> <p>Shadows are created when an opaque (non see-through) object blocks the light source.</p> <p>Shadows change depending on the distance the object is from the light source and the position of the light source.</p> <p>Light appears to travel in straight lines, travelling from light sources until it hits the surface of an object.</p> <p>Looking directly at sun light/ light sources, even when wearing sunglasses</p>	<p>Light from a torch travels straight to our eyes.</p> <p>Mirrors reflect light. This means that light bounces off them.</p> <p>When light hits rough objects, the light is reflected in many different directions, so they do not reflect much light.</p> <p>A periscope works by reflecting light from an object through a number of mirrors.</p> <p>Shadows are dark areas which appear when light is blocked by an object.</p> <p>A filter is a transparent material that absorbs some colours and allows others to pass through.</p>
Scientific Enquiry			<p>A prediction is when we explain what we think might happen.</p>	

					<p>The results of an experiment can be recorded in a table, line graphs and bar charts.</p> <p>When we are writing our method, we are writing instructions for carrying out an experiment.</p> <p>A fair test is when one variable is changed but other elements are kept the same.</p> <p>A conclusion is an end result or an outcome.</p>	
Vocabulary threading through our science curriculum strands						
Strand	Nursery	Reception	Year 1 Year 2	Strand	Year 3 Year 4	Year 5 Year 6
Materials			strong clay brick roof slate window pane window frame cotton waterproof opaque transparent		Solid Evaporating Liquid Condensation Gas Matter Temperature Particles Heating Volume Cooling Boiling	conductive magnetic thermal conduct dissolve solute solvent substance filtering evaporation insulate soluble
Animals inc Humans			fish amphibian reptile mammal bird warm-blooded cold-blooded herbivore fins		vitamins nutrition minerals balanced endoskeleton exoskeleton spine tibia rib cage	aorta vessels artery circulation red blood cells white blood cells ventricle atrium

			scales Survival Exercise Shelter Balance Grow Hygiene Healthy Bacteria Balanced diet Germs Nutrients Vitamins Life Cycle Foetus Womb Offspring Reproduction Transformation Metamorphosis Froglet		hamstrings biceps radius Intestine Molars Oesophagus Canines Stomach Incisors Gall Bladder Cavity Saliva Enamel Peristalsis Plaque	Adolescent Breeding Reproduce Embryo Dependent Womb Puberty Motor Skills Foetus Hormone Gestation Neurodegenerative Inherit Adaption Epiphytes Fossil Mary Anning Palaeontologist Ichthyosaurus Charles Darwin Evolved Natural Selection Ancestor Homo Sapiens
Forces and Magnets					friction attraction repulsion magnetic poles magnetic needle force resistance repel	Sir Isaac Newton parachute water resistance streamlined buoyant upthrust lever pulley pivot

					gravity	load mesh bevel gear rack and pinion
Earth Science			Summer Harvest Winter Temperature Spring Rainfall Autumn Changes Seasons Sleet Hibernate Frost			axis planet moon star satellite spherical rotate solar system orbit lunar heliocentric astronomy Weather Global warming Recycle Biodegrade Net zero Greenhouse gas Industrial revolution Combustion COP Conference Species Habitat
Electricity					Electricity Batteries Circuit Voltage Current	Circuit Battery Electricity Resistor Variable Resistor

					Bulb Conductor Insulator Switch Control Wind turbines Hydropower	Dimmer Switch Output Systematically Synchronised Signal Conductor Insulator
Living things and their habitats			reproduce excrete respire habitat survive microhabitat producer consumer living dead non-living nutrition Habitat Endangered Survive Extinct Microhabitat Pollution Desert Biodiversity Tundra Environment Climate Organism		Adapted Camouflage Coastal Grassland Classify Species Sub-group Classification Key Region Blubber Ecosystem Oxygenised	Microorganism Domain Classify Microscopic Unicellular Ecosystem Multicellular Mycelium Kingdom Reproduction Species Habitat
Plants			Photosynthesis		fertiliser	

			Carbon dioxide Oxygen Glucose Pollination Germination Crop Forests		potassium chlorophyll photosynthesis xylem phloem anther filament stomata transpiration pollen nectar	
Rocks					igneous rock magma sedimentary rock metamorphic rock weathering acid rain erosion fossil decompose fragments	
Sound					vibrations pitch sound source reflection decibels energy sound waves volume insulation instruments frequency reflect	

<p>Light</p>					<p>light reflect vitamin d ultraviolet rays fluorescent high visibility shadow ray cast position shape puppet</p>	<p>light light source reflected variable angle mirror opaque transparent sunshade rotate optical spectrum</p>
<p>Scientific Enquiry</p>					<p>Scientific Investigation Prediction Plausible Record Data Method Control experiment Equipment Enquiry Practical Conclusion Fair test</p>	