

St Barnabas CE Primary School - Science LTP & Knowledge Progression - Rotation A 2022/2023

	Autumn 1 A	Autumn 2 A	Spring 1 A	Spring 2 A	Summer 1 A	Summer 2 A
EYFS	Use of Everyday Materials 1		Animals including humans 1		Plants 1	
Year 1			Seasonal changes - Spring		Seasonal changes - Summer	
Year 2						
Possible cross-curricular links (English) Additional links to follow	Year one: The tiger who came to tea - use different materials found on a dinner table Year two: The colour monster - separate materials into jars/containers		EYFS: The Three Little Pigs, Owl Babies, The Gruffalo Year one: The Three Little Wolves and the Big Bad Pig, Into the forest Year two: Tadpole's promise		Year one: The red tree	
Working scientifically Statutory requirements	<p>Year one and two</p> <p>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> ● 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. 					
Knowledge progression	<p>Children know an object is the name we give to an item and a material is what an object is made from.</p> <p>Children know all objects are made of one or more materials.</p> <p>Children can describe the simple properties of everyday materials.</p> <p>They know some objects can be made from different materials e.g. spoons can be made of plastic, metal or wood.</p>	<p>The children need to be able to name and identify a range of animals in each group (fish, amphibians, reptiles, birds and mammals) e.g. they should be able to name specific birds, fish and mammals.</p> <p style="background-color: yellow;">They do not need to use the terms mammal, reptiles etc. or know the key characteristics of each group.</p> <p>Children know that animals eat certain things</p>	<p>The year is divided into four parts according to the weather, each part is called a season.</p> <p>Our seasons are called summer, autumn, winter and spring.</p> <p>Children know that in the UK, the day length is longest in summer (about 16 hours) and gets shorter each day until winter (about 8 hours) before getting longer again.</p>	<p>Children can name an array of plants which grow in our country. e.g. daffodil, daisy, sunflower, rose, bluebell, poppies and snowdrop.</p> <p>Children know that deciduous trees (oak/ beech) drop their leaves during autumn and grow them again during spring.</p> <p>They also recognise that evergreen trees (holly/ pine) keep their leaves all year round.</p>	<p>The year is divided into four parts according to the weather, each part is called a season.</p> <p>Our seasons are called summer, autumn, winter and spring.</p> <p>Children know that in the UK, the day length is longest in summer (about 16 hours) and gets shorter each day until winter (about 8 hours) before getting longer again.</p>	

			<p>- some eat other animals (carnivores), some eat plants (herbivores), some eat both plants and animals (omnivores).</p> <p>Children can use some of the basic ways in which animals vary (tails, ears and their different skin coverings e.g. scales, feathers, hair) to identify animals and compare them.</p> <p>Children know that humans find out about the world using their senses. We have five senses – sight, touch, taste, hearing and smelling. Children can link these senses to particular parts of the body.</p>	<p>Children also know that the weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer.</p> <p>Children can also describe other changes in the seasons. For example: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people.</p>	<p>Children can identify the common structure of plants: roots, stem, leaves and flower.</p> <p>Children can identify the common structure of a tree: roots, trunk, branches and leaves.</p>	<p>Children also know that the weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer.</p> <p>Children can also describe other changes in the seasons. For example: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people.</p>
Key vocabulary	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	Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ear and tongue	<p>Weather - sunny, rainy, windy, snowy etc.</p> <p>Seasons - winter, summer, spring, autumn.</p> <p>Sun, sunrise, sunset, day, length.</p>	<p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, evergreen, deciduous, oak, beech, holly, pine</p>	<p>Weather - sunny, rainy, windy, snowy etc.</p> <p>Seasons - winter, summer, spring, autumn.</p> <p>Sun, sunrise, sunset, day, length.</p>	
Year 3	Rocks/fossils/soil 3	Forces and magnets 3	Animals including humans: food chains 4	Living things and their habitats: classification 4	Light: reflection and shadow 3	Animals including humans: nutrition 3
Year 4						
Possible cross-curricular links (English) Additional links to follow		Iron man	Dominic grows sweetcorn			

<p>Working scientifically Statutory requirements</p>	<p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • 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. 					
<p>Knowledge progression</p>	<p>Rock is a naturally occurring material that can be found in different shapes and sizes (stones, pebbles, boulders).</p> <p>There are different types of rock e.g. sandstone, limestone, slate etc. all of which have different properties.</p> <p>Children can identify key properties of rocks, e.g.:</p> <ul style="list-style-type: none"> - Hardness (How difficult is it to scratch/ wear away?) - Density (Will it sink?) - Appearance (Does it have different sizes of grains or crystals?) - Porous (Does it absorb water?) <p>Rocks can be grouped into 3 categories: igneous/ sedimentary/ metamorphic</p> <ul style="list-style-type: none"> - Igneous: a rock formed from cooled magma or lava (granite) - Sedimentary: a rock formed from layers of 	<p>A force is a push or a pull.</p> <p>For some forces to act, there must be contact e.g. a hand pulling open a door, the wind pushing the trees.</p> <p>Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts or repels.</p> <p>A magnet attracts magnetic material. Iron and nickel and other materials containing these (e.g. stainless steel) are magnetic.</p> <p>Magnets will not attract non-magnetic materials. Examples of these materials are: wood, paper, glass, plastic, or rubber.</p> <p>The strongest parts of a magnet are the poles.</p>	<p>Living things can be classified as producers, predators and prey according to their place in the food chain.</p> <p>Producer: Plants get their energy from the Sun. They are called producers because they make their own food.</p> <p>Consumer: Animals are called consumers because they do not make their own food. They have to eat plants and other animals.</p> <p>Predator: Animals that eat other animals are called predators.</p> <p>Prey: The animals predators eat are called prey.</p>	<p>Living things can be grouped (classified) in different ways according to their features.</p> <p>Classification keys can be used to identify and name living things.</p> <p>Living things live in a habitat which provides an environment to which they are suited (Year 2 learning).</p> <p>These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change.</p> <p>This can be in a good way (i.e. positive human impact, such as setting up nature reserves)</p> <p>Or, in a bad way (i.e. negative human impact, such as littering/ pollution/deforestation).</p> <p>These environments also change with the seasons;</p>	<p>We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness.</p> <p>Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light.</p> <p>Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective.</p> <p>The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light.</p> <p>Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface</p>	<p>Plants can make their own food but animals cannot and need to eat in order to get the nutrients they need.</p> <p>A piece of food will often provide a range of nutrients. Children should be able to understand the basic roles of the different nutrient types:</p> <ul style="list-style-type: none"> - Carbohydrates/ fats = provide energy - Vitamins and minerals = keep us healthy - Protein = helps us grow and repair our muscles - Fibre = helps us digest the food we have eaten <p>Children can identify some basic foods which can correspond with these nutrient types. E.g. bread= carbohydrate / cheese = fat + protein/ chicken = protein</p>

	<p>sediment being pressed down hard and sticking together. (chalk/ limestone/ sandstone)</p> <ul style="list-style-type: none"> - Metamorphic: a rock which started as sedimentary or igneous but changed due to extreme heat or pressure (marble/ slate) <p>Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter).</p> <p>The type of rock, size of rock pieces and the amount of organic matter affecting the properties of the soil.</p> <p>Some rocks contain fossils.</p> <p>Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant material is replaced by minerals from the water.</p>	<p>Magnets have two poles – a north pole and a south pole.</p> <p>If two like poles, e.g. two north poles, are brought together they will push away from each other – repel.</p> <p>If two unlike poles, e.g. a north and south, are brought together they will pull together – attract.</p> <p>When an object moves on a surface, the texture (type) of the surface and the object affect how it Moves.</p> <p>Some surface will allow objects to move across them easier than others.</p>		<p>different living things can be found in a habitat at different times of the year.</p>	<p>and blocks some of the light.</p> <p>The size of the shadow depends on the position of the source, object and surface.</p> <p>Children can identify the meanings of:</p> <ul style="list-style-type: none"> - Opaque: a material which light cannot pass through - Transparent: a material which light can pass through - Translucent: a material which is not transparent but clear enough to allow light to pass through. They are cloudy to look through. 	
<p>Key vocabulary</p>	<p>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, sedimentary, metamorphic, igneous</p>	<p>Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole</p>	<p>Teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, consumer, producer, predator, prey, food chain</p>	<p>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate</p>	<p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous</p>	<p>Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water</p>

Year 5	Earth and Space 5	Forces: gravity, levers, pulleys, gears 5	Animals including humans: circulatory system, diet and lifestyle 6	Living things and their habitats: classification 6	Light: straight lines/shadow 6	Animals including humans: changes with age 5
Year 6						
Possible cross-curricular links Additional links to follow						
Working scientifically Statutory requirements	<p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • 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 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. 					
Knowledge progression	<p>The Sun is a star. It is at the centre of our solar system.</p> <p>There are 8 planets (children should be able to identify these).</p> <p>These travel around the Sun in fixed orbits.</p> <p>Earth takes 365¼ days to complete its orbit around the Sun.</p> <p>The Earth rotates (spins) on its axis every 24 hours.</p> <p>As Earth rotates, half faces the Sun (day) and</p>	<p>A force is a push or pull that causes an object to start moving, stop moving, speed up, slow down or change direction.</p> <p>We can measure forces in Newtons using a Newton- metre or force-metre.</p> <p>Gravity is a non-contact force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.</p> <p>Air resistance, water resistance and friction</p>	<p>The children can explain the human circulation system:</p> <ul style="list-style-type: none"> - The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. - The blood goes back to the heart and is then pumped around the body. - Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. - As they are used, they produce carbon dioxide 	<p>Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, toadstools and mushrooms.</p> <p>Plants can make their own food whereas animals cannot.</p> <p>Animals can be divided into two main groups: those that have backbones (vertebrates);</p>	<p>Light travels in straight lines. These lines are often called light rays.</p> <p>We see objects when light from them goes into our eyes.</p> <p>The light may come directly from light sources.</p> <p>However, for most objects, light must be reflected from the object into our eyes for the object to be seen.</p> <p>Objects that block light (opaque or translucent) will cause shadows.</p>	<p>Children can explain the stages of humans developing from a foetus into a child then on to old age:</p> <ul style="list-style-type: none"> - Foetus : At this time, a baby is growing inside its mum's womb. - Infancy: A baby is born after spending nine months inside the womb. When babies are young, they grow rapidly. They are very dependent on their parents. - Childhood: This is between 3-10 years. Children develop many skills in this stage. For example they learn to walk, talk, run, jump, go to the toilet alone, eat

	<p>half is facing away from the Sun (night).</p> <p>As the Earth rotates, the Sun appears to move across the sky.</p> <p>The Earth rotating on its axis also gives us seasons.</p> <ul style="list-style-type: none"> - We have summer when the northern hemisphere is tilted near to the sun. - We have winter when the northern hemisphere is tilted away from the sun. <p>The Moon orbits the Earth. It takes about 28 days to complete its orbit.</p> <p>There are 8 phases of the moon (children should be able to identify these).</p> <p>The Sun, Earth and Moon are approximately spherical.</p>	<p>are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air/ water may be moving over a stationary object.</p> <p>Air resistance and water resistance usually work against the force of gravity.</p> <p>A mechanism is a device that allows a small force to be increased to a larger force.</p> <p>Pulleys, levers and gears are all mechanisms, also known as simple machines.</p> <p>Simple machines allow small forces to be increased to a larger force.</p>	<p>and other waste products.</p> <ul style="list-style-type: none"> - Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. <p>Children understand that nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed.</p> <p>Diet, exercise, drugs and lifestyle have an impact on the way our bodies function.</p> <ul style="list-style-type: none"> - They can affect how well our heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. - Some conditions are caused by deficiencies in our diet e.g. lack of vitamins. 	<p>and those that do not (invertebrates).</p> <p>Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals.</p> <p>Children can identify the key features of each vertebrate group. (e.g. skin type/ life cycle features/ warm/cold blooded / breathes with lungs or gills).</p> <p>Each group has common characteristics.</p> <p>Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms.</p> <p>Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants.</p>	<p>Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object.</p> <p>A shadow can be elongated or shortened depending on the angle of the light source.</p>	<p>with cutlery and read and write.</p> <ul style="list-style-type: none"> - Adolescence: Adolescents undergo physical changes due to puberty. They are increasingly independent but continue to rely on their parents. - Adulthood: Adults have stopped growing taller. The human body is at its peak of fitness and strength. They are responsible for themselves. - Old age: There is a decrease in muscle mass and strength. Skin loses its elasticity and wrinkles appear. Senses become weaker. <p>Children should be able to identify that humans have a gestation period of 9 months.</p>
<p>Key vocabulary</p>	<p>Earth, Sun, Moon, spherical, solar system, rotates, axis, star, orbit, planets, phases, waxing, waning, crescent, gibbous, hemisphere, seasons + all planet names in our solar system.</p>	<p>Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears</p>	<p>Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle, villi, small intestine</p>	<p>Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering, micro-organisms , bacteria, yeast, toadstools, mushrooms</p>	<p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, straight lines, light rays</p>	<p>Infancy, childhood, adolescence, early/ middle/ late adulthood, life cycle, reproduction, gestation</p>