

Science Whole School Overview
Progression of Knowledge

Knowledge taken from the national curriculum/ **unit questions**/vocabulary

	<u>EYFS (Early Years Foundation Stage) - (Development matters)</u>	<u>Year 1</u>	<u>Year 1/2</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 3/4</u>	<u>Year 4</u>	<u>Year 5 x 2</u>	<u>Year 6</u>
<u>Early Learning Goals</u>	<p><u>Communication and Language –</u> Make comments about what they have heard and ask questions to clarify their understanding.</p> <p><u>Personal, Social and Emotional Development –</u> Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.</p> <p><u>Understanding the World –</u> Explore the natural world around them, making observations and drawing pictures of animals and plants.</p>								

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	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. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.								
<u>Plants</u>	<p>See living things and their habitats.</p> <p>After close observation, draw pictures of the natural world, including animals and plants.</p> <p>Describe what they see, hear and feel whilst outside - Encourage focused</p>	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>What are the common features of plants? Do plants change over time? Can I identify and name a variety of common wild and garden plants?</p>	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. Year 2 also observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need</p>	<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Where do plants come from ?</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>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.</p>	<p><u>Teach alongside Living Things (Plants and living things)</u> (Year 3)</p> <p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they</p>			

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	<p>observation of the natural world.</p> <p>Listen to children describing and commenting on things they have seen whilst outside, including plants and animals.</p> <p>Name and describe some plants and animals children are likely to see, encouraging children to recognise familiar plants and animals whilst outside.</p>	<p>How could I describe plants? What are deciduous vs evergreen trees?</p>	<p>water, light and a suitable temperature to grow and stay healthy.</p> <p>How are seeds different? Do they grow the same way? Can I label the different parts of a plant? How are plants different? Where do plants and flowers come from? What do plants need to grow?</p>	<p>What do plants need to grow?</p> <p>What is a suitable temperature for cress to grow at?</p> <p>What is the life cycle of a sunflower?</p> <p>What would happen if a plant didn't get any water/light?</p>	<p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>What are the different parts of a flower? Do plants need more than water, light and heat? How is water transported in plants? Can plants create more plants? What is the life cycle of a flowering plant?</p>	<p>vary from plant to plant.</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. What are the different parts of a flower? Do plants need more than water, light and heat? How is water transported in plants? Can plants create more plants? What is the life cycle of a flowering plant?</p>			
	<p>Tree, grow, trunk, flowers, seed, stem, fruit.</p>	<p>Leaves, flowers, blossom, petals, fruit, berry, root,</p>	<p>Leaves, flowers, blossom, petals, fruit, berry, root,</p>	<p>As for Year 1 plus light, shade, sun, warm, cool,</p>	<p>Photosynthesis, pollen, insect/wind</p>	<p>Photosynthesis, pollen, insect/wind</p>			

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		seed, branch, stem, bark, stalk, bud.	seed, branch, stem, bark, stalk, bud. Plus (for year 2) light, shade, sun, warm, cool, water, grow, healthy, bulb, germinate, shoot, seedling.	water, grow, healthy, bulb, germinate, shoot, seedling.	pollination, seed formation, seed dispersal.	pollination, seed formation, seed dispersal .			
<u>Animals, including humans</u>	<u>Animals</u> Name and describe animals that live in different habitats. Describe different habitats.	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). How are animals different or the same? Can I identify the features of the different animal types? Can I compare and contrast the features of different animals?	(with health as one term-long unit to cover both year 1 and 2). Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) How are animals different or the same? Can I identify the features of the different animal types?	Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Which nutrients to animals, including humans, need? What is a balanced diet? Why is it important?	<u>Year 3 and 4</u> (Year 3) Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Why do animals including humans need the right nutrients?	(Year 4) Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey. Are all teeth the same?	(Combine with Living things and their habitats) Describe the changes as humans develop to old age. How and why do humans age? How do our bodies change?	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals. How do our hearts and lungs work?
	<u>Humans</u> Describe people who are familiar to them. Learn about how to take care of themselves. Describe what they see, hear and feel whilst outside - Encourage focused			<u>From Sep 2023, questions linked</u>					

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	<p>observation of the natural world.</p> <p>Listen to children describing and commenting on things they have seen whilst outside, including plants and animals.</p> <p>Name and describe some plants and animals children are likely to see, encouraging children to recognise familiar plants and animals whilst outside.</p>	<p>What do animals eat? How can animals be grouped? Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense What are senses? How do we see things? Why doesn't everything feel the same? How do we smell things? Why do we not all like the same food? How do we hear sounds?</p>	<p>What do animals eat? How can animals be grouped? Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. What are senses? How do we see things? Why doesn't everything feel the same? How do we smell things? Why do we not all like the same food? How do we hear sounds?</p> <p>Year 2 also</p> <p>Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for</p>	<p><u>to trout not ducks.</u></p> <p>What does a duck need to survive? What is the life cycle of a duck? How are offspring linked to adults? Can I make a healthy snack for an Alien visiting earth? How could I exercise on the Moon? Can I write the life cycle of a duck?</p>	<p>What if humans didn't have a skeleton? What is the difference between vertebrates and invertebrates? Why do we need muscles? How do muscles help me to move?</p>	<p>Do I eat a balanced diet? Why is a skeleton needed? Why do we need muscles?</p> <p>(Year 4) Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p>Can I understand, construct and interpret food chains? Are all teeth the same? Why do humans need teeth? What is the digestive system?</p>	<p>What do teeth do?</p> <p>How can I keep my teeth healthy?</p> <p>What are the different parts of the digestive system?</p> <p>How does the digestive system work?</p> <p>What does a food chain show us?</p>		<p>Can I explain the function of the heart and the process of blood circulation?</p> <p>What is in our blood and how does it move around our bodies?</p> <p>How important are diet, exercise and drugs to our lifestyle and bodies?</p> <p>How do water and nutrients travel around our bodies?</p>
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			<p>survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p><u>From Sep 2023, questions linked to ducks</u></p> <p>What does a duck need to survive? What is the life cycle of a duck? How are offspring linked to adults? What makes some food 'healthy'? Why is exercise important?</p>			How does the digestive system function?			
	Hair, eyes, skin, head, body, ears, mouth, teeth, face, arms, legs, feet, humans, animal, birds, fish, nocturnal.	fish, amphibians, reptiles, birds, mammals, herbivore, omnivore, carnivore, tongue.	fish, amphibians, reptiles, birds, mammals, herbivore, omnivore, carnivore, tongue. Year 2 and health - Offspring, reproduction,	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise,	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support,	Digestive system, digestion, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, incisor, canine, molar,	Digestive system, digestion, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, incisor, canine, molar,	Puberty – the vocabulary to describe sexual characteristics	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, water, cycle, circulatory

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	Habitats – hot, cold, wet, dry, sea, land. Baby, child, adult, old, young, (family members),		growth, young/old stages (examples - chick/hen, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)	heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)	protect, move, skull, ribs, spine, muscles, joints, diet.	premolars, producer, predator, prey, food chain	premolars, producer, predator, prey, food chain		system, drugs, lifestyle.
Everyday materials Properties and changes of materials States of matter	<p>Explore a range of materials, including natural materials.</p> <p>Make objects from different materials, including natural materials.</p> <p>Observe, measure and record how different materials change when heated and cooled.</p> <p>Compare how materials change over time and in different conditions.</p> <p>Observe and interact with</p>	<p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their</p>	<p>Distinguish between an object and the material from which it is made.</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Describe the simple physical properties of a variety of everyday materials and</p>	<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>Can I identify everyday materials?</p>		<p>Teach alongside Rocks</p> <p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>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).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the</p>	<p>Year 4) Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>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).</p> <p>Identify the part played by evaporation and condensation in the water cycle</p>	<p>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.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p>	

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	<p>natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water.</p>	<p>simple physical properties.</p> <p>What is a material?</p> <p>Can I name different materials?</p> <p>How are materials different?</p> <p>Are all materials suitable?</p> <p>What material would make a good jacket?</p> <p>What material would make a good umbrella.</p>	<p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (year 1 to compare and group them).</p> <p>What is an object made from? How can I describe different materials? Would wool make a good window? Could my cutlery be made of chocolate? Can an object change shape? Can I compare different materials? What material would make the best cape for Supertato?</p>	<p>Can I find different uses for materials in different places?</p> <p>Can I sort (classify) objects made from different materials?</p> <p>What material would make the best beach hut?</p> <p>What makes the best material for a windbreak?</p> <p>Can I design a beach hut using materials that I can change?</p>		<p>rate of evaporation with temperature.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>What are solids, liquids and gasses?</p> <p>Can an object change state?</p> <p>How does water change state?</p> <p>What role does evaporation and condensation play in the water cycle?</p>	<p>and associate the rate of evaporation with temperature.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>What are states of matter?</p> <p>Can a state of matter change? Can we make furniture out of chocolate?</p> <p>Do all solids take the same time to melt?</p> <p>Can water change state? Can I create liquid from a gas? What is the water cycle?</p>	<p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>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</p>	
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								<p>action of acid on bicarbonate of soda.</p> <p>In what ways could I group or sort materials?</p> <p>Are some materials best suited for certain objects? Why ?</p> <p>What are irreversible and reversible changes? Can I un-bake a cake? How could I separate mixture? What is the difference between a solution and a mixture? How can we purify materials? Can we separate a solution?</p>	
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	Ice, water, frozen, melt, smooth, soft, bendy, soggy, strong, weak, hot, hard, soft.	Object, material, wood, plastic, glass, metal, rock, brick, paper, fabric, elastic, rubber, wool, clay, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, shiny, dull, see-through, not see-through.	Object, material, wood, plastic, glass, metal, rock, brick, paper, fabric, elastic, rubber, wool, clay, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, shiny, dull, see-through, not see-through. Properties of materials – Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/puling, twist/twisting, squash/squashing , bend/bending, stretch/stretching .	Properties of materials – Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/puling, twist/twisting, squash/squashing , bend/bending, stretch/stretching .		Solid, liquid, gas, state change, melting point, boiling point, evaporation, condensation, temperature, water cycle	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	
	Play and explore outside in all	Observe changes across the four seasons.	Observe changes across the four seasons.						

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Seasonal changes	seasons and in different weather.								
	Observe living things throughout the year.	Observe and describe weather associated with the seasons and how day length varies.	Observe and describe weather associated with the seasons and how day length varies.						
	Understand the effect of changing seasons on the natural world around them -	What are seasons?	Are all seasons the same? What is the same and different about the seasons? Why does a tree lose its leaves? Are animals affected by the seasons? Can the length of a night change?						
	Guide children's understanding by draw children's attention to the weather and seasonal features.	How does the weather change throughout the year?							
	Provide opportunities for children to note and record the weather. Select texts to share with the children about the changing seasons.	What affect does the weather have on our world? Do seasons affect animals and living things?							
	Throughout the year, take children outside to observe the natural world and encourage children to observe how	Can the length of a day change?							

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	animals behave differently as the seasons change.								
	Look for children incorporating their understanding of the seasons and weather in their play								
	Spring, Summer, Winter, Autumn, Seasons, day, night.	Weather (sunny, rainy, windy, snowy), sun, sunrise, sunset, day length.	Weather (sunny, rainy, windy, snowy), sun, sunrise, sunset, day length.						
Living things and their habitats	Explore the plants in the surrounding natural environment.		Explore and compare the differences between things that are living, dead, and things that have never been alive.	Explore and compare the differences between things that are living, dead, and things that have never been alive.		<u>Teach alongside Plants (Plants and living things)</u> (Year 4) Recognise that living things can be grouped in a variety of ways.	Recognise that living things can be grouped in a variety of ways.	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.
	Explore the animals in the surrounding natural environment.		Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.	Identify 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.		Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Describe the life process of reproduction in some plants and animals.	Give reasons for classifying plants and animals based on specific characteristics.
	Explore plants and animals in a contrasting natural environment.					Recognise that environments can change and that this can sometimes pose	Recognise that environments can change and that this can sometimes pose dangers to living things.	Are all life cycles the same? How are a birds and mammals life cycle different? Can I describe the life cycle of an	

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	<p>Describe what they see, hear and feel whilst outside - Encourage focused observation of the natural world.</p> <p>Listen to children describing and commenting on things they have seen whilst outside, including plants and animals.</p> <p>Name and describe some plants and animals children are likely to see, encouraging children to recognise familiar plants and animals whilst outside.</p>		<p>Identify and name a variety of plants animals in their habitats, including micro-habitats. 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.</p> <p>What is a habitat? How do I know if something is living or dead? What habitats can I find in my local area? Are all habitats the same? How do animals adapt to their habitat? What if plants didn't exist? (added for the food chain).</p>	<p>Identify and name a variety of plants animals in their habitats, including micro-habitats. 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.</p> <p>What lives at St George's? How do I know if something is dead or alive? Why do animals and plants live in certain places? How do plants feed animals ? Why are habitats different? (added)</p>		<p>dangers to living things.</p> <p>How can we group living things? What is a classification key? Can I use a key and evidence to identify invertebrates in my local area? Do I recognise positive and negative changes in the local environment? What are the environmental dangers to endangered species?</p>	<p>What is a habitat? (recap)</p> <p>How can I group living things?</p> <p>How can I use a classification key to identify living things? Can I use a key to identify trees and their leaves? What dangers to living things face? How can I help protect them?</p>	<p>insect and an amphibian? What is the same and different in life cycles of animals and humans? What is a gestation period? Why are they different for different animals (including humans)? How do plants reproduce? How do some animals reproduce?</p>	<p>What are micro – organisms?</p> <p>How are they the same/different to plants and animals?</p> <p>How can we classify all living things?</p> <p>How can I classify plants?</p>
	<p>Alive, dead, home, habitat, food.</p>		<p>(Year 2) Living, suited, never been alive, suitable, basic needs, food, food chain, shelter, move, feed, survive, survival.</p>	<p>Living, suited, never been alive, suitable, basic needs, food, food chain, shelter, move, feed, survive, survival.</p>		<p>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate.</p>	<p>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate.</p>	<p>Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets,</p>	<p>Vertebrates, invertebrates, flowering, non-flowering, warm blooded, cold blooded.</p>

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			Names of local habitats e.g., pond, woodland etc.	Names of local habitats e.g. pond, woodland etc.				runners, bulbs, cuttings .	
			Names of micro-habitats e.g., under logs, in bushes etc.	Names of micro-habitats e.g. under logs, in bushes etc.					
Rocks					<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p> <p>Can Rocks tell stories?</p>	<p><u>Teach alongside states of matter</u></p> <p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p> <p>How can rocks be different?</p>			

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					Are all rocks the same?	How permeable and durable are different rocks?			
					How could I group rocks?	How are fossils formed?			
					What is the earth made from?	How is soil created?			
					Are some rocks stronger than others?	Is all soil the same?			
					Rock, stone, pebble, boulder, grain, crystals, layers, texture, absorbs, fossil, marble, chalk, granite, sandstone, slate, soil, peat.	Rock, stone, pebble, boulder, grain, crystals, layers, texture, absorbs, fossil, marble, chalk, granite, sandstone, slate, soil, peat.			
Light	Explore shadows. Explore rainbows. Observe and interact with natural processes, such as ice melting, a sound causing a				Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces.	Teach alongside Sound Recognise that they need light in order to see things and that dark is the absence of light.			Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen

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	vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water.				<p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>Find patterns in the way that the size of shadows change.</p> <p>Why do we need light?</p> <p>What is the dark?</p> <p>How do objects reflect light?</p>	<p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>Find patterns in the way that the size of shadows change.</p> <p>How does light help us see? Which surfaces reflect light? Why are mirrors good reflectors? Why is light from the sun dangerous and how can I protect my eyes from it? Which materials block light to form shadows? Is my shadows the same size</p>			<p>because they give out or reflect light into the eye.</p> <p>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.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>Can light travel around a bend?</p> <p>Where should I put a mirror in the car?</p> <p>How can we see something that is</p>
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					How does light travel?	throughout the day?			not a light source?
					What is a shadow?				How could a periscope help us win the war?
					What if there was no sun?				What shapes are shadows?
									Where do colours come from?
	Light, dark, shadow, shady sunlight.				light source, absence of light, transparent, translucent, opaque, matt, reflect, mirror.	light source, absence of light, transparent, translucent, opaque, matt, reflect, mirror.			As for Year 3 - , plus light rays, bounce,
Forces and Magnets	<p>Explore how to change how things work.</p> <p>Explore how the wind can move objects.</p> <p>Explore how objects move in water.</p>				<p>Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p>	<p><u>Teach alongside electricity</u> (year 3) Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p>		<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water</p>	

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	<p>Observe and interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water.</p>				<p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>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.</p> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>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.</p> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <p>Can objects really be attracted to each other? What are pushing and pulling forces?</p>		<p>resistance and friction, that act between moving surfaces.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> <p>Why do objects fall to the ground? How does air resistance effects moving objects? How does water resistance effects moving objects? What if there was no friction? What are levers, pulleys and gears? Can a force be made bigger?</p>	
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Science Whole School Overview

					<div>How to objects move on different surfaces?</div>	<div>Can a surface stop things moving? Is everything magnetic ? How can I find out?</div>			
					<div>Do all forces need objects to touch?</div>	<div>Are all magnets the same strength?</div>			
					<div>What is a magnetic pole? How can they attract objects?</div>	<div>What is a magnetic pole? How can objects be pushed away?</div>			
					<div>What does repel mean?</div>				
					<div>Are all magnets the same strength?</div>				
	Pull, push, strong, weak, float, sink, turn, spin.				Force, twist, contact force, non-contact force, magnetic force, names of magnets, attract,	Force, twist, contact force, non-contact force, magnetic force, names of magnets, attract,		Force, gravity, Earth, air resistance, water resistance, friction, mechanisms,	

Science Whole School Overview

					repel, magnetic, poles, north pole, south pole.	repel, magnetic, poles, north pole, south pole.		simple machines, levers, pulleys, gears	
Sound	<p>Listen to sounds outside and identify the source.</p> <p>Make sounds.</p> <p>Observe and interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water.</p>					<p>Teach alongside Light</p> <p>(Year 4)</p> <p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p>	<p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p>		

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						<p>Recognise that sounds get fainter as the distance from the sound source increases.</p> <p>How is a sound made?</p> <p>How does sound travel?</p> <p>How do we hear sounds?</p> <p>Can sounds change?</p> <p>Can a sound be louder?</p> <p>Could we hear a sound made on the moon?</p>	<p>Recognise that sounds get fainter as the distance from the sound source increases.</p> <p>How is a sound made?</p> <p>How does sound travel?</p> <p>How do we hear sounds?</p> <p>Can sounds change?</p> <p>Can a sound be louder?</p> <p>Could we hear a sound made on the moon?</p>		
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Science Whole School Overview

	Loud, quiet, sound, travel, listen, hear.					Source, vibrate, vibration, pitch (high, low), volume, faint, loud, insulation.	Source, vibrate, vibration, pitch (high, low), volume, faint, loud, insulation.		
Electricity	Identify electrical devices. Use battery powered devices.					<p><u>Teach alongside Forces and Magnets</u> (Year 4) Identify common appliances that run on electricity.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>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.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or</p>	<p>Identify common appliances that run on electricity.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>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.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p>		<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>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.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p> <p>How do I draw a circuit?</p>

Science Whole School Overview

						<p>not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>How is electricity generated ?</p> <p>Is all electricity the same? Can electricity travel? Can I identify and sort materials into electrical insulators or conductors? Can you stop electricity from travelling?</p>	<p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>What items need electricity? What is a circuit? Why are circuits important? What are insulators and conductors? What is a switch and why are they important? What is a buzzer?</p>		<p>What are the recognised scientific symbols in a circuit? Are all bulbs the same brightness? How do bulbs, switches and buzzers work? What is the purpose of circuits? Can I create my own circuit?</p>
	Power, battery, plug, on, off.					<p>Electricity, wire, electrical appliance/device, mains, electrical circuit, complete circuit, component, cell, battery, positive, negative,</p>	<p>Electricity, wire, electrical appliance/device, mains, electrical circuit, complete circuit, component, cell, battery, positive, negative,</p>		<p>Circuit, circuit diagram, circuit symbol, voltage -</p> <p>Children do not need to understand what voltage is, but will use volts and</p>

Science Whole School Overview

						connections, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator.	connections, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator.		voltage to describe different batteries.
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Science Whole School Overview

Earth and Space	Learn about the Earth, Sun, Moon, Planets and stars.							Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.	
	Learn about space travel.							Describe the movement of the Moon relative to the Earth.	
								Describe the Sun, Earth and Moon as approximately spherical bodies.	
								Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
								What shape are the Earth, Sun and Moon? What planets are in our solar system?	

Science Whole School Overview

								<div>What are night and day?</div> <div>Can I explain why Stonehenge might tell the time?</div> <div>How do the Earth, other planets and the moon move relative to the Sun?</div>	
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Science Whole School Overview

	Earth, Moon, Planet, space, Sun, star, sky.							(Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, orbit.	
Inheritance and Evolution									<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that</p>

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									adaptation may lead to evolution.
									How is a cactus adapted to its environment?
									What would the ultimate adapted animal look like?
									How does adaptation can lead to evolution?
									Could things evolve in the future?
									How much am I like my parents?
									What can fossils tell us about evolution?
									Offspring, sexual reproduction, vary,

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[illegible]

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- Class 9 and 10 - Examining the importance of self-care in the life cycle of a human including old age (year 5).
 - Using the gardening area to grow sustainable and healthy food
- Class 11 – Circulatory system and asking how we can look after our heart. Exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.

Whole school – growing Pumpkins, daily mile, Eco club.

The Early Years curriculum for Science is taken from EYFS Framework Section 7 but steered by the children's interests. 'All About Me' booklets completed by parents before children start school allow us to design a curriculum that meets the needs and interests of the children. Early Years staff continually discusses ideas with the children and change planning accordingly. The curriculum is designed to be taught using group work, individual work and through carefully designed continuous provision that encourages children to revisit and remember previously taught skills. One example being investigating floating and sinking when learning about 'Lost and Found' by Oliver Jeffers.

Trips and Visitors

We aim to give all children skills and knowledge through meaningful real life experiences including trips and visits from people who have jobs in Science based industries. This gives our Science teaching purpose and inspires children to be determined and confident in using their own ideas and experiences to solve problems. It also widens their appreciation and recognition of science related knowledge and skills outside of school whilst allowing them opportunity to view the vast array of future employment opportunities related to science. These experiences include:

- Smithills Farm
- Martin Mere trip
- Talk with a nurse when learning about Florence Nightingale.
- installation of trout and tank. Trip to Eureka Museum.
- Blackpool Zoo talk.
- United Utilities visit.
- Jodrell Bank trip
- Trip to UCLAN University Science Department. Trip to Manchester Science Museum.
- Lancashire Science Festival and Local High School visits.
- Virtual visits (zoom).

Whole School – Chick eggs, duck eggs, Partridge eggs, Mad Science club and assembly, STEM club, parent visitors and Virtual visits for every class in school at least once a year.

Pupil Voice

The pupils' views have also inspired the way our curriculum has been designed. Children across the school reported an enjoyment of Science, practical lessons and applying their learning to the world around them. This is indicative of the question based inquisitive curriculum we have designed for our children in which they link their learning in the classroom to the world around them and understand the prominence of Science in wider life. Class 9 and 7 reported enjoying the mix of lesson types and problem solving that Science involves. This is something that we want all our children at St George's to enjoy and is why our curriculum is designed to progress both knowledge and skills throughout the straight age and mixed age classes and why are curriculum takes the form of questions to begin each lesson.

Children in Class 10 and 5 voiced a wish for more 'whizz bang' and 'impressive' science experiments. Therefore, our curriculum has been designed to include a wider variety of science experiments and investigations across the range scientific skills outlined in the National Curriculum. Science units now also begin with a 'wow' science experiment demonstrated by the teacher or watched online to hook the children. STEM challenges are set on the school Facebook page and were set throughout Lockdown for the children to take part in at home. Year 4 and 5 also have access to the 'Whizz Pop Bang' science magazine to enable them to see the impact of science in the wider world to give the children those 'wow' moments.

Children in class 6 and 4, although reported enjoying the practical element of science, struggled with recording what they have learnt. We have therefore ensured a variety of recording techniques across the curriculum including labelling, diagrams, short writes, tables, graphs, mind maps as well as ensuring a progression across the school in recording investigations and experiments so that by the end of Year 6, children are confident to record independently.

Children across KS2 explained that they enjoyed science particularly when they can come up with their own questions to investigate and are given independence to conduct and record the investigation/experiment. Our curriculum has been designed to foster this independence throughout the school and can be seen through the progression of skills whereby independence in comparative testing in KS1 (Key Stage 1) and fair testing in KS2 is built upon each year.

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Children across the school were able to name some professions that link to Science. The job titles the children talked about included doctor, scientist, vet and astronaut. When asked to describe a 'scientist', children mostly described the stereotypical white elderly male in a white lab coat. Our curriculum therefore aims to widen the professions that children at St George's link to Science and its related fields and that they aspire to through the opportunities we offer them including a trip to Jodrell Bank, a talk from a nurse and construction site manager, discussion with an engineer and a trip to Martin Mere.

Progression

We have planned the topics in Science so that they build upon prior learning. Units begin with informal methods of assessment to understand where the children are in their learning and what they know and remember from the last time a topic was covered (ASE resources help staff know what the children should have covered in previous year groups and what they don't need to cover before the next year groups/key stage). We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit, and we also build progression into the whole school Science curriculum, so that the children are increasingly challenged as they move up through school. Scientific skills have been mapped across the school in order to show how we as a school, develop the children's 'Working Scientifically' skills and how these are built upon across the different topics and across the key stages: We use the Lancashire Key Learning Document as a supplement to the National Curriculum to ensure that objectives are taken from specific year group content and that scientific skills are being advanced and built upon.

In terms of mixed age classes, the Science curriculum has been designed so that every child will access their year group knowledge objectives from the National Curriculum. In some cases, this means combining two linked topics from different year groups, in others it means teaching two inputs or setting up a different 'learning area'/project. Where topics overlap, the science curriculum has been designed so that different skills are taught within a unit so that if a child is in two consecutive mixed age classes, teaching of knowledge may overlap but the progression of Scientific skills is still evident.

In Science, our children are entitled to a curriculum which enables them to develop an awareness of the world around them and, in so doing, achieves respect, tolerance and understanding of what it means to be a positive citizen of the world and the importance of caring for the world around us; embedding the schools fundamental British and Christian Values.

Progression of Skills/Working Scientifically

		EYFS	Year 1	Year 1/2	Year 2	Year 3	Year 3/4	Year 4	Year 5	Year 6
<u>WS from NC</u>	<u>Ask questions and recognise that they can be answered in different ways including research using secondary sources.</u>		<u>Ask simple questions and recognise that they can be answered in different ways.</u> While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. The children answer questions developed with the teacher often through a scenario. The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered.			<u>Ask relevant questions and use different types of scientific enquiry to answer them.</u> The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. The children answer questions posed by the teacher. Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.			<u>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</u> Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.	
- Plants				Look at packets to decide how to plant and care for seeds.	Look at packets to decide how to plant and care for seeds.	Research the functions of the parts of flowering plants.				

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<p>- Animals, including humans</p>	<p>Learn how animals from a different habitat are cared for.</p> <p>Learn about animals in a different habitat.</p> <p>Humans – Find out information from visitors (dentist or nurse).</p>	<p>Generate questions for investigation such as Do all animals have....? Do people with longer arms have longer legs? Use secondary sources to name animals seen in the local environment that they may not be able to name.</p>	<p>Asking questions about what things animals need for survival and what humans need to stay healthy and suggesting ways to find answers to their questions. Use secondary sources to name animals seen in the local environment that they may not be able to name.</p>	<p>Asking questions about what things animals need for survival and what humans need to stay healthy and suggesting ways to find answers to their questions.</p>	<p>Research different food groups and how they keep us healthy and design meals based on what they find out.</p> <p>Researching how our bodies move and what our bodies can do and researching different exercises/sports /pastimes and how they can work different parts of our bodies and different muscle groups.</p>	<p>Comparing the teeth of carnivores and herbivores, and suggesting reasons for differences. Research what different animals eat (year 4)</p>	<p>Finding out what damages teeth and how to look after them. Research the different parts of the digestive system.</p>	<p>Develop questions to ask an expert.</p>	<p>Generate questions to research about the human circulatory system.</p>
<p>- Everyday materials/ - Properties and changes of materials. - States of matter</p>		<p>Distinguish between an object and the material from which it is made.</p>	<p>Distinguish between an object and the material from which it is made.</p>			<p>Research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid.</p>	<p>Researching and discussing how chemical changes have an impact on our lives, for example cooking.</p>	<p>Discuss [research] the creative use of new materials such as polymers, super-sticky and super-thin materials.</p>	
<p>- Seasonal changes</p>	<p>Find out about how animals behave in different seasons.</p> <p>Find out about the weather across the world.</p>								

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- Living things and their habitats			Describing how they decided where to place things, exploring questions such as: 'Is a flame alive? Is a deciduous tree dead in winter?' Talking about ways of answering their questions.	Describing how they decided where to place things, exploring questions such as: 'Is a flame alive? Is a deciduous tree dead in winter?' Use secondary sources to name plants and animals seen in the local environment. Talking about ways of answering their questions.		Research and be able to name plants and animals in the wider environment. (in the rainforest, in the oceans, in desert areas and in prehistoric times).	Research global environmental issues on their impact on living things. Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world.	Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times). Asking pertinent questions and suggesting reasons for similarities & differences.	Researching unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system. Research the difference between bacteria, virus and fungi and why they are not plants or animals.
- Rocks					Research rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time.	Research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed.			
- Light									
- Forces and Magnets					Raising questions and carrying out tests to find out how far things move on different surfaces and gathering and			Design and make artefacts that use simple gears and/or springs and explore their effects.	

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					recording data to find answers to their questions.			Research Heath Robinson and Rube Goldberg Machines.	
- Sound						Research the pitch and volume of instruments in order to make their own.	Research the pitch and volume of instruments in order to make their own.		
- Electricity									
- Earth and Space	Find out about the solar system, stars and space travel.						Comparing the time of day at different places on the Earth through internet links and direct communication.	Finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks. [research]	
- Evolution and inheritance									Observing and raising questions about animals and how they are adapted to the environment.

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		EYFS	Year 1	Year 1/2	Year 2	Year 3	Year 3/4	Year 4	Year 5	Year 6
<u>WS from NC</u>	<u>Observing and using equipment to measure. (Including opportunities for observing over time)</u>		<u>Observing closely, using simple equipment.</u> Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. They begin to take measurements, initially by comparisons, then using non-standard units.			<u>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</u> The children make systematic and careful observations. They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.			<u>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</u> The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).	
- Plants			Observe the growth of flowers and vegetables closely using a magnifying glass, and comparing and contrasting familiar plants. Observe a tree throughout the year.	Observe the growth of flowers and vegetables closely using a magnifying glass, and comparing and contrasting familiar plants. Observe a tree throughout the year. Observing similar plants at different stages of growth.	Observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb,	Discovering how seeds are formed by observing the different stages of plant cycles over a period of time.	Observing how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.			

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<ul style="list-style-type: none"> - Animals, including humans 		<p>Using their observations to compare and contrast animals at first hand or through videos and photographs.</p> <p>Using their senses to compare different textures, sounds and smells.</p>	<p>Observing, through video or first-hand observation and measurement, how different animals grow and compare and contrast.</p> <p>Using their senses to compare different textures, sounds and smells.</p>	<p>Observing, through video or first-hand observation and measurement, how different animals grow.</p> <p>Observe a life cycle.</p>	<p>Observing and comparing their (animals) movement; exploring ideas about what would happen if humans did not have skeletons</p>	<p>Observing and comparing their (animals) movement; exploring ideas about what would happen if humans did not have skeletons</p>			<p>Observe pulse rates before, during and after exercise.</p>
<ul style="list-style-type: none"> - Everyday materials/ - Properties and changes of materials. - States of matter 	<p>How does a loaf cook differently in different tins? How do ice cubes melt in different areas?</p>	<p>Describe the simple physical properties of a variety of everyday materials.</p>	<p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs).</p>	<p>Comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs).</p>		<p>Observe and record evaporation over a period of time for example, a puddle in the playground. Watch frozen liquids melt.</p>	<p>Watch hand prints dry.</p>	<p>Observing and comparing the changes that take place, for example, when burning different materials or baking bread or cakes.</p>	

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- Seasonal changes	How does a snowman change? How do the trees change with the seasons?	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies. Make observations of daylight hours – diary of toy fox.	Observe changes across the four seasons. Take weather measurements and make observations over time/record what children are wearing. Observe and describe weather associated with the seasons and how day length varies.						
- Living things and their habitats			Describing the conditions in different habitats and micro-habitats (under log, on stony path, under bushes); Finding out how the conditions affect the number and type(s) of plants and animals that live there.	Describing the conditions in different habitats and micro-habitats (under log, on stony path, under bushes); Finding out how the conditions affect the number and type(s) of plants and animals that live there.		Raising and answering questions based on their observations of animals in the local environment at different times of the year.	They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. Observe changes in an animal over a period of time (for example, by hatching and rearing chicks).	Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times). Grow from and harvest bulbs throughout the year.	
- Rocks					Observe how soil separates into different layers in water.	Observing rocks, including those used in buildings and gravestones,			

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						and exploring how and why they might have changed over time.			
- Light	How does a toy's shadow change during the day?								Deciding [observe/explore] where to place rear-view mirrors on cars. Investigating the relationship between light sources, objects and shadows by using shadow puppets extend their experience of [explore and observe] light by looking at a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).
- Forces and Magnets									
- Sound	Listen to the siren of an emergency vehicle as it approaches and moves away.								

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- Electricity						Observing patterns - that bulbs get brighter if more cells are added, that metals tend to be conductors, and that some materials can and cannot be used to connect across a gap in a circuit.	Observing patterns - that bulbs get brighter if more cells are added, that metals tend to be conductors, and that some materials can and cannot be used to connect across a gap in a circuit.		
- Earth and Space								Measure shadows throughout the day.	
- Evolution and inheritance									Observing and raising questions about local animals and how they are adapted to the environment.

	EYFS	Year 1	Year 1/2	Year 2	Year 3	Year 3/4	Year 4	Year 5	Year 6
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<u>WS from NC</u>	<u>Gathering and recording from grouping and classifying enquiries.</u>		<u>Record (comparing/grouping/classifying) using groups, tables and simple Venn diagrams to sort.</u>			<u>Record (comparing/grouping/ classifying) using scientific diagrams and classification keys using intersecting venn diagrams and carroll diagrams.</u>		<u>Record (comparing/grouping/ classifying) using scientific diagrams and classification keys of increasing complexity including branching databases and keys.</u>		
- Plants			Compare and contrast familiar plants describing how they were able to identify and group them.	Compare and contrast familiar plants describing how they were able to identify and group them.	Based on the children's own criteria: Classify seeds and bulbs.					
- Animals, including humans	Animals - Sort animals according to where they live. Humans – Sort images of people according to characteristics.	Describing how they identify and group them...grouping animals according to what they eat.	Describing how they identify and group them...grouping animals according to what they eat/classify animals based on physical structure.	Based on children's own criteria: classify food items and animals.	Identifying and grouping animals with and without skeletons.	Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat.	Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat.			
- Everyday materials/ - Properties and changes of materials. - States of matter		Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Compare and group together a variety of everyday materials on the basis of their simple physical properties - Classify objects	Identifying and classifying the uses of different materials, and recording their observations. Compare and group together a variety of everyday materials on the basis of their simple physical properties - Classify objects	Identifying and classifying the uses of different materials, and recording their observations.		Grouping and classifying a variety of different materials including solids and liquids.	Grouping and classifying a variety of different materials including solids and liquids.	After observing what happens when solids are added to liquids, classify material based on the outcomes.		

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		made from the same material/different materials/different fabrics based on texture.	made from the same material/different materials/different fabrics based on texture.						
- Seasonal changes	Which clothes are suitable for each season?								
- Living things and their habitats	Name and describe plants and animals that they find in school grounds.		Sorting and classifying things as to whether they are living, dead or were never alive.	Finding, sorting and classifying things as to whether they are living, dead or were never alive.		Use and make simple guides or keys to classify and identify local plants.	Use and make simple guides or keys to classify and identify local animals.	Classify animals according to life cycle.	Using classification systems and keys to identify some animals and plants in the immediate environment. Create a branching database to classify a set of living things.
- Rocks					Using a hand lens or microscope to help them identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.	Using a hand lens or microscope to help them identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.			
- Light					Classify light sources.	Classify light sources.			
- Forces and Magnets					Comparing how different things	Sorting materials into those that are		Design and make	

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					move and grouping them.	magnetic and those that are not.		artefacts that use simple gears and/or springs and explore their effects.	
- Sound						Based on their own criteria, sort musical instruments.	Based on their own criteria, sort musical instruments.		
- Electricity						Classify household appliances leading to electrical/non-electrical and battery powered/mains. Test materials to classify as insulators and conductors (year 4)	Classify household appliances leading to electrical/non-electrical and battery powered/mains. Test materials to classify as insulators and conductors.		
- Earth and Space									
- Evolution and inheritance									Comparing and classifying how some living things are adapted to survive in extreme conditions, for example cactuses, penguins & camels.

	EYFS	Year 1	Year 1/2	Year 2	Year 3	Year 3/4	Year 4	Year 5	Year 6
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WS from NC	Plan and carry out comparative/fair tests and pattern seeking surveys.		Perform simple test			Set up simple practical enquiries, comparative and fair tests.		Planning different types of scientific enquiry, including recognising and controlling variables where necessary.		
			The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out comparative tests and pattern seeking enquiries.			The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. They follow their plan to carry out comparative and simple fair tests and pattern seeking enquiries.		The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.		
- Plants			Pattern seeking – based on observations, encourage children to identify patterns e.g. after comparing the size of leaves on different plants, children may suggest ‘bigger plants have bigger leaves.’	Pattern seeking – based on observations, encourage children to identify patterns e.g. after comparing the size of leaves on different plants, children may suggest ‘bigger plants have bigger leaves.’	Setting up a comparative test to show that plants need light and water to stay healthy. Children can generate own questions.	Investigate what happens when conditions are changed.	Investigate what happens when conditions are changed.			
- Animals, including humans	Humans – Are taller children faster? Are taller children stronger?	Can I taste the difference between....?	Can I taste the difference between....?							Complete different activities to compare the impact on their own heartrate.
- Everyday materials/ - Properties and changes of materials. - States of matter	How does a loaf cook differently in different tins?	Performing simple tests to explore questions, for example: ‘What	Performing simple tests to explore questions, for example: ‘What	Test materials for different uses.		Explore the effect of temperature on substances such as chocolate,	What affects the rate of evaporation?	Carry out tests to answer questions such as ‘Which materials would		

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	How do ice cubes melt in different areas?	is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'	is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'			butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a part).		be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?'	
- Seasonal changes		At the end of the year, look for patterns in evidence e.g. Does it rain more in spring? Do we have more sunny days than in summer? Which is the coldest month?	At the end of the year, look for patterns in evidence e.g. Does it rain more in spring? Do we have more sunny days than in summer? Which is the coldest month?						
- Living things and their habitats	Look for minibeasts in different areas of school grounds. Look for plants in different areas of the school grounds.			Children can generate own questions for investigation such as: Where do you see more butterflies? Where do you see more Ivy?		Do plants with.....have....?	Do animals withhave blank....?		
- Rocks					Explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together [hardness test] or what changes occur when	Explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together [hardness test] or what changes occur when they			

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					they are in water [permeability test].	are in water [permeability test].			
- Light					Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.	Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. Test materials for reflectiveness.			Investigating the relationship between light sources, objects and shadows by using shadow puppets extend their experience of [explore and observe] light by looking at a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur). Link this to light travelling in straight lines.
- Forces and Magnets	How do cars move down ramps? Compare how different balls bounce.				Raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers to their questions.	Exploring the strengths of different magnets and finding a fair way to compare them.		Exploring resistance in water by making and testing boats of different shapes. Exploring falling paper cones or cup-cake cases and designing and making [exploring] a	

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								variety of parachutes and carrying out fair tests to determine which designs are the most effective. Explore levers.	
- Sound	What sound does rain make landing on different containers?					Make earmuffs from a variety of different materials to investigate which provides insulation against sound.	Make earmuffs from a variety of different materials to investigate which provides insulation against sound.		
- Electricity									Systematically identifying the effect of changing one [thing] component at a time in a circuit.
- Earth and Space	Find simple patterns in how temperature changes as the sun is moves or is obscured.								
- Evolution and inheritance									Use different pieces of equipment to look for patterns linking the suitability of bird's beak to the food available.

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		EYFS	Year 1	Year 1/2	Year 2	Year 3	Year 3/4	Year 4	Year 5	Year 6	
<u>WS from NC</u>	<u>Interpreting and concluding (communicating results)</u>		<u>Using their observations and ideas to suggest answers to questions.</u>			<u>Using straightforward scientific evidence to answer questions or to support their findings.</u>		<u>Identifying scientific evidence that has been used to support or refute ideas or arguments</u>			
			<u>Begin to notice patterns and relationships.</u>			<u>Using straightforward scientific evidence to answer questions or to support their findings.</u>		<u>Identifying scientific evidence that has been used to support or refute ideas or arguments</u>			
			Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources.			Children answer their own and others’ questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.		Children answer their own and others’ questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. They talk about how their scientific ideas change due to new evidence that they have gathered. They talk about how new discoveries change scientific understanding.			
			The children recognise ‘biggest and smallest’, ‘best and worst’ etc. from their data.			Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.					
						They draw conclusions based on their evidence and current subject knowledge.			In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not		

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									fit the overall pattern; and explain their findings using their subject knowledge.	
- Plants		Compare and contrast what they have found out about different plants.	Compare and contrast what they have found out about different plants.		Comparing the effect of different factors on plant growth, for example the amount of light, the amount of fertiliser.	Looking for patterns in the structure of fruits that relate to how the seeds are dispersed.				
- Animals, including humans		Using their senses to compare different textures, sounds and smells.	Using their senses to compare different textures, sounds and smells. Asking questions about what things animals need for survival and what humans need to stay healthy and suggesting ways to find answers to their questions.	Asking questions about what things animals need for survival and what humans need to stay healthy and suggesting ways to find answers to their questions.	Observing and comparing their (animals) movement; exploring ideas about what would happen if humans did not have skeletons.	Observing and comparing their (animals) movement; exploring ideas about what would happen if humans did not have skeletons.		Researching the gestation periods of other animals and comparing them with humans. (discuss with year 5 teacher different animals to cover).	Exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.	
- Everyday materials/ - Properties and changes of materials. - States of matter								Compare materials in order to make a switch in a circuit.		
- Seasonal changes										
- Living things and their habitats								Comparing how different animals reproduce and grow. (discuss		

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								<u>with year 5 teacher different animals to cover).</u>	
- Rocks					Raise and answer questions about the way soils are formed.	Raise and answer questions about the way soils are formed.			
- Light					Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.	Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.			
- Forces and Magnets					Looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another.	Identifying how properties make magnets useful in everyday items and suggesting creative uses for different magnets.	Identifying how properties make magnets useful in everyday items and suggesting creative uses for different magnets.		
- Sound						Find patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thickness.	<u>(Year 4 project)</u> Find patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thickness.		

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- Electricity									Designing and making a set of traffic lights, a burglar alarm or some other useful circuit.
- Earth and Space									
- Evolution and inheritance									Analysing the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.

		EYFS	Year 1	Year 1/2	Year 2	Year 3	Year 3/4	Year 4	Year 5	Year 6
<u>WS from NC</u>	<u>Recording and presenting data</u>		<u>Gathering and recording data to help in answering questions</u> The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. They classify using simple prepared tables and sorting rings.			<u>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</u> The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record		<u>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</u> The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams,		

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						classifications e.g. using tables, Venn diagrams, Carroll diagrams. Children are supported to present the same data in different ways in order to help with answering the question.		Carroll diagrams and classification keys. Children present the same data in different ways in order to help with answering the question.		
- Plants		Drawing diagrams showing the parts of different plants. Keep records of how plants have changed over time, for example the leaves falling off trees and buds opening.	Drawing diagrams showing the parts of different plants. Keep records of how plants have changed over time, for example the leaves falling off trees and buds opening.							
- Animals, including humans							Draw and discuss their ideas about the digestive system.	Compare diagrams/drawings with models and images.	Finding out and recording the length and mass of a baby as it grows.	
- Everyday materials/ - Properties and changes of materials. - States of matter			Identifying and classifying the uses of different materials, and recording their observations.	Identifying and classifying the uses of different materials, and recording their observations.						
- Seasonal changes		Making tables and charts about the weather. Make displays of what happens in the world around them. Including day length, as	Making tables and charts about the weather. Make displays of what happens in the world around them. Including day length, as the seasons change.							

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		the seasons change.							
- Living things and their habitats			Recording their findings of whether things are alive, dead or were never alive using charts. Constructing a simple food chain that includes humans (e.g. grass, cow, human);	Recording their findings of whether things are alive, dead or were never alive using charts. Constructing a simple food chain that includes humans (e.g. grass, cow, human);					Using classification systems and keys to identify some animals and plants in the immediate environment.
- Rocks									
- Light									Designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works.
- Forces and Magnets					Raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers to their questions.	Raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers to their questions.	Exploring falling paper cones or cup-cake cases and designing and making [exploring] a variety of parachutes and carrying out fair tests to determine which designs are the most effective.	Exploring resistance in water by making and testing boats of different shapes.	
- Sound						Make and play their own instruments by using what they have found out	<u>(Year 4 project)</u> Make and play their own instruments by using what they have found out		

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						about pitch and volume.	about pitch and volume.		
- Electricity									
- Earth and Space								Constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day.	
- Evolution and inheritance									Comparing how some living things are adapted to survive in extreme conditions, for example cactuses, penguins & camels.

	EYFS	Year 1	Year 1/2	Year 2	Year 3	Year 3/4	Year 4	Year 5	Year 6
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<p><u>WS</u> <u>from NC</u></p>	<p><u>Evaluating</u> <u>Investigations</u></p>			<p><u>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</u></p> <p><u>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</u></p> <p>Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.</p> <p>Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry. They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.</p>	<p><u>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</u></p> <p><u>Using test results to make predictions to set up further comparative and fair tests</u></p> <p><u>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</u></p> <p>Children evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. They identify any limitations that reduce the trust they have in their data.</p> <p>Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.</p>
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