

St Swithun's C of E Primary Academy

Science Progression Document

Progression of Skills							
Year group	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants	Introduction to Plants	Introduction to plants continued.	Plant Growth	Plant Reproduction			
	BQ- 'Do all living things grow in the same way?' The World (Range 3) Is curious and interested to explore new and familiar experiences in nature: grass, mud, puddles, plants, animal life. (Range 4) Can talk about some of the things they have observed such as plants, animals, natural and found objects. (Range 5) Develop an understanding of growth, decay and changes over time. (Range 5) Shows care and concern for living things and the environment. (Range 6) Looks closely at similarities, differences, patterns and change in nature. (Range 6) Makes observations of animals and plants and explains why some things occur, and talks about changes. Working Scientifically Nursery: <u>Investigate</u> how to plant seeds, water them and <u>talk about</u> what they are doing. <u>Observe and talk about</u> what they see happening to a seed as it grows into a plant. Working Scientifically Reception: <u>Observe and Investigate</u> the world around them closely <u>Describe and comment</u> on things they have seen, including plants and animals. <u>Recognise and know</u> the names of common plants. <u>Observe</u> closely and make simple representations of living things	BQ- 'Why do leaves fall from some trees in the Autumn?' - Identify and name a range of common wild and garden plants, naming their differences. - Identify and name deciduous and evergreen trees. - Know that deciduous trees lose their leaves seasonally but evergreen do not. - Identify and describe the basic structure of a range of flowering plants and trees. - To begin to understand how plants grow and change over time. Working Scientifically: <u>Observing closely</u>, perhaps using magnifying glasses. <u>Comparing and contrasting</u> familiar plants: describing how they were able to <u>identify and group</u> them. <u>Drawing diagrams</u> showing the parts of different plants including trees. <u>Keeping records</u> of how plants have <u>changed over time</u>, for example the leaves falling off trees and buds opening; and <u>comparing and contrasting</u> what they have found out about different plants.	BQ- 'Do climbing plants actually climb?' - To know that seeds and bulbs grow into seedlings by producing roots and shoots. - Know that seedlings grow into mature plants by developing parts, that may include stems/trunks, leaves, flowers and fruit. - Know that seeds need water to germinate - Know that plants need water, light and a suitable temperature for growth and health. Working Scientifically: <u>Observing and recording, with some accuracy</u>, the growth of a variety of plants as they <u>change over time</u> from a seed or bulb, or <u>observing</u> similar plants at different stages of growth. <u>Setting up a comparative test</u> to show that plants need light and water to stay healthy.	BQ- 'Why are there so many methods of pollination?' - Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. - Know the relationship between structure and function. - To know that plants need water, light, air, nutrients and a suitable temperature for growth and health. - Understand that the needs for growth vary from plant to plant. - Know the life cycle of a plant from seed to mature plant. - To know that flowers are the reproductive organ of a plant. - Know that the process of pollination is the transfer of pollen to the female part of the flower. - Know that the process of seed formation is the growth of a seed after pollination/fertilisation - To know some different methods of seed dispersal and the benefits of each. Working Scientifically: <u>Comparing</u> the effect of different <u>factors on plant growth</u>, for example the amount of light, the amount of fertiliser. <u>Discovering</u> how seeds are formed by <u>observing</u> the different stages of plant cycles <u>over a period of time</u>. <u>Looking for patterns</u> in the structure of fruits that relate to how the seeds are dispersed. <u>Observing</u> how water is transported in plants, for example, by putting cut, white carnations into coloured water and <u>observing</u> how water			
Plant Structure and function							
Plant Growth and needs							
Plant Life cycle							

				<i>travels up the stem to the flowers.</i>			
Plants Key Vocabulary :	Grass, mud, stones, pebbles, puddles, plant, animal, life, leaf, stick, twig, seed. Growing, dying, alive. Comparative language: Taller/shorter, similar to, different from. Local plants/trees: Oak, pine, sycamore, willow Daisy, dandelion, Daffodil, Poppy	Labelling Features: plant, seedling, tree, leaf, flower, blossom, petals, fruit, root, bulb, seed, stem, branch, twig, trunk etc. Common Plant Names eg. Dandelion, Daisy, Oak Tree. Deciduous, Evergreen, Wild plant, indoor plant, herb, weed, vegetable/fruit/salad.	Comparative Verbs: Tall/taller/tallest, similar to, different from. Labelling Features: Root, stem, leaf, flower, seed, seedlings, plants, branch, twig, trunk and weed. Names of plants. Living, Non-living, alive, not alive, dead, healthy, producer, grow.	Flowering plant, root/roots, leaf/leaves, stem/trunk, flowers, pollen, transfer, pollination, seed formation, seed, fruit, transported insects/birds/animals. Seed dispersal: Explosion, Wind, Water, Animal. Life cycle, growth, reproduce, air, light, water, nutrients, soil, room to grow, fertiliser.			
Animals, Including Humans.		Sensitive Bodies – Comparing animals	Life Cycles and Health	Movement and Nutrition	Digestion and food	Human Timeline	Circulation and exercise
BQ- ‘What makes me human?’ People and Communities (Range 3) Is curious about people and shows interest in stories about people, animals, or objects that they are familiar with or which fascinate them. (Range 4) Learns that they have similarities and differences that connect them to, and distinguish them from others (Range 6) Knows about similarities and differences between themselves and others, and among families, communities, cultures and traditions. The World (Range 4) Can talk about some of the things they have observed such as plants, animals, natural and found objects. (Range 6) Comments and asks questions about aspects of their familiar world, such as the place where they live or the natural world. (Range 6) Developing an understanding of growth, decay and changes over time. (Range 6) Makes observations of animals and plants and explains why some things occur and talks about changes.	BQ- ‘Why do some animals have tails?’ To know a variety of common animals (including fish, amphibians, reptiles, birds and mammals). To know the main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks, shell) To know key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth). To know the five main senses: sight, smell, hearing, taste and touch. To know that the skin is used for touch, the tongue is used for taste, the nose is used for smell, the eyes are used for sight and the ears are used for hearing. To know that a carnivore is an animal that eats other animals and to give some examples. To know that a herbivore is an animal that eats only plants and to give some examples. To know that an omnivore is an animal that eats both animals and plants, and to give some examples. Working Scientifically: - Using their observations to compare and contrast animals [humans] at first hand or through videos and photographs. Using their senses to compare different textures, sounds and smells. Working Scientifically (Other Animals): - Using their observations to compare and contrast animals	BQ- ‘What are eggs?’ To understand how living things change, and that animals have offspring that grow into adults. To know which offspring comes from which parent animal. To know the stages in some animal life cycles. To know that animals, including humans, need water, food and air to survive. To understand the importance of exercise, a balanced diet and hygiene for humans. Working Scientifically: observing, through video or first-hand observation and measurement, how different animals grow; asking questions about what things animals need for survival suggesting ways to find answers to their questions.	BQ- ‘Do bones help animals?’ To know that animals can be grouped based on the presence of a skeleton. To know that the skeleton in humans and some animals is used for movement, protection and support. To know that the muscular system in humans and some animals works with the skeleton for movement. To know the main bones in the body. To know that animals, including humans, need the right types and amount of nutrition. To understand that humans cannot make their own food and therefore eat to get the nutrition needed. To know the main food groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) and their simple functions. To know that a balanced diet should include all food groups. To describe the diets of different animals. Working Scientifically: Identifying and grouping animals with and without skeletons. Observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. Could possibly link to some PE and Health related aspect during this unit as no other health units are covered in the NC2014 Statutory Yr3 Curriculum.	BQ- ‘Why do some animals migrate?’ To know the main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions. To know the different types of human teeth (incisor, canine, premolar and molar) and their simple functions. To know that teeth can be damaged, including the effect of sugary and acidic food. To know that it is important to brush teeth twice a day, make good food choices and visit the dentist regularly. To describe the teeth of carnivores and herbivores, and understand why they are different. To know that predators hunt for their food and prey are the animals being hunted. To know that producers make their own food. To know that food chains begin with a producer followed by consumers, and arrows to show the energy passed on. Working Scientifically: Comparing the teeth of carnivores and herbivores. Suggesting reasons for differences. Finding out what damages teeth and how to look after them. Drawing and discussing their ideas about the digestive system and comparing them with models or images.	BQ- ‘What makes marsupials different?’ To describe the human life cycle, including the stages of growth and development (baby, toddler, child, teenager, adult, elderly). To describe changes that occur during puberty (in boys and girls). To know that gestation periods vary across mammals. Working Scientifically: Researching the gestation periods other animals and comparing them with humans. Finding out and recording the length and mass of a baby as it grows	BQ- ‘Why do we sweat sometimes?’ To know the main parts of the human circulatory system (heart, blood vessels and blood). To know that the heart pumps blood around the body. To know that the blood vessels transport blood around the body. To know that the blood transports vital substances around the body, including oxygen and nutrients. To understand the relationships between different organ systems. To understand the impact of diet, exercise, drugs and lifestyle on the way a body functions. To know that the heart rate is the number of beats per minute and breathing rate is the number of breaths per minute. To know that exercise increases heart and breathing rates. Working Scientifically: Exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health. Observing/measuring changes to breathing, heart beat and or pulse rates after exercise	

	Working Scientifically Nursery: <u>Observe and distinguish</u> between baby animals and those that are fully grown <u>Talk about and demonstrate</u> care for Minibeasts in their environment. Working Scientifically Reception: <u>Observe and Investigate</u> the world around them closely <u>Describe and comment</u> on things they have seen, including plants and animals. <u>Recognise and know</u> the names of common animals. <u>Observe</u> closely and make simple representations of living things	at first hand or through videos and photographs. <u>Describing</u> how they <u>identify and group</u> them.. <u>Grouping</u> animals according to what they eat. <u>Using their senses.</u>		Researching <u>ng</u> how our bodies move and what our bodies can do and <u>researching</u> different exercises/sports/pastimes and how they can work different parts of our bodies and different muscle groups.			
Key Vocabulary :	Body parts: Head, shoulders, knee, toes, fingers. Comparative language: bigger, smaller, taller, shorter, older, younger. Different / same Changed, changing.	Words linking to the senses: e.g. sense, eye, sight, see, ear, hearing, smell, nose, touch, feel Parts of the body for humans: arm, head, leg, body, etc. Comparative language: tall/taller/tallest, long/longer/longest, similar to, different from Describe, observe, compare Expressions making generalisations e.g. 'we all...' Other Animals: Features linked to movement e.g. fly, swim, crawl, run, climb, etc. Features linked to body covering e.g. feathers, fur, scales, colour, camouflage, etc. Common animal types: mammal, bird, fish, amphibians, reptiles Comparative language: tall/taller/tallest, long/longer/longest, similar to, different from Describe, observe, compare, because Expressions making generalisations e.g. 'most have...'	Survival, Food, Water, Oxygen, Reproduce, Excrete.	Words relating to skeletons and muscles e.g. ribs, spine, skull, contract, relax, vertebrate Features of skeletons: movement, support, protection (organs) Words which have other meanings in other contexts e.g. relax Animal groups: vertebrates and invertebrates, insects, minibeasts, mammals, reptiles, fish, birds, amphibians	Eat, chew, breakdown, saliva, swallow, feed, feeding, healthy, unhealthy, function, producer, predator, prey, dentist, toothpaste, dental care, hygienist Teeth, gums, incisor, molar, canine. Digestive system, mouth, tongue, oesophagus, stomach, small intestine, large intestine, faeces. Words which have different meanings in other contexts e.g. diet, root, activity, decay, evidence, conclusion. Other words which might arise through discussion / research but are not essential: peristalsis, digestive juices, churn, energy, nutrients, absorbed, blood, liver, bladder, anus.	Changes, develop/development, grow/growth, baby, toddler, young, teenager, adult, old age, timeline, stages, puberty, gestation periods, compare	Heart, heartbeat, pulse, pulse rate, muscle, blood vessel, blood, lung, oxygen, carbon dioxide, circulate, circulatory system, organ Diet, exercise, drugs, lifestyle, body function, harmful, healthy, damaged, nutrients, water, transported, substances
Living Things and Their Habitats. Characteristics of living things Variation and inheritance Habitats and Independence.	BQ- ‘Can a frog live at the beach?’ People and Communities (Range 3) Enjoys stories about people and nature (birds, bees, snails, cats, dogs, etc) and is interested in photographs of themselves with these. The World (Range 3) Is curious and interested to explore new and familiar experiences in nature: grass, mud, puddles, plants, animal life		Habitats Microhabitats		BQ- ‘How many types of birds do I know?’ To know that living things can be grouped in different ways. To know that a classification key can be used to group and identify plants and animals. To know that vertebrates are animals which have a backbone and invertebrates are animals which do not have a backbone. To know that plants can be grouped into flowering or non-flowering varieties.	BQ- ‘What is a potato?’ To know that a life cycle shows the changes an animal or plant goes through until the reproduction of a new generation when the cycle starts again. To know that all living things must reproduce for the species to survive. To know that sexual reproduction requires two parents, whereas asexual reproduction only requires one parent. To know that there are different processes plants and animals use to reproduce (asexual and sexual reproduction).	BQ- ‘Can we eat all mushrooms?’ To know that ‘organism’ is a term used to refer to an individual living thing. To know that micro-organisms are incredibly small and cannot usually be seen by the naked eye. To know the characteristics of the different groups of vertebrates and commonly found invertebrates. To know that living things have changed over time. To know that fossils provide us with information about living things that

	(Range 4) Can talk about some of the things they have observed such as plants, animals, natural and found objects (Range 5) Shows care and concern for living things and the environment (Range 6) Talks about the features of their own immediate environment and how environments might vary from one another (Range 6) Knows about similarities and differences in relation to places, objects, materials and living things (Range 6) Makes observations of animals and plants and explains why some things occur, and talks about changes (Range 6) Looks closely at similarities, differences, patterns and change in nature Working Scientifically Nursery: <u>Talk about and demonstrate</u> care for Minibeasts in their environment. Working Scientifically Reception: <u>Observe and Investigate</u> the world around them closely <u>Describe and comment on</u> things they have seen, including plants and animals. <u>Recognise and know</u> the names of common animals. <u>Observe</u> closely and make simple representations of living things <u>Observe and talk about</u> seasonal changes and their impact on familiar animals and plants		To name a variety of habitats, including woodland, ocean, rainforest and seashore. To know that a habitat is the environment where an animal or plant lives/ grows, because it provides what they need to survive. To know that a micro-habitat is a very small habitat (e.g. stones, logs and leaf litter). To know that living things depend upon each other (e.g. for food, shelter.) To understand that a food chain can be used to show how animals obtain food from eating either plants and/or other animals. Working Scientifically: <u>Sorting and classifying</u> things according to whether they are living, dead or were never alive, and <u>recording</u> their findings using charts. <u>Describing</u> how they decided where to place things. <u>Exploring questions</u> such as: 'Is a flame alive? Is a deciduous tree dead in winter? <u>Talking about ways of answering their questions.</u> <u>Constructing a simple food chain</u> that includes humans (e.g. grass, cow, human). <u>Describing</u> the conditions in different habitats and micro-habitats (under log, on stony path, under bushes). <u>Finding out how the</u> conditions <u>affect</u> the number and type(s) of plants and animals that live there.		To know that flowering plants include grasses and non-flowering plants includes ferns and mosses. To know that there are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish. To know that invertebrate groups include snails, slugs, worms, spiders and insects. To know that habitats can change throughout the year and this can be dangerous for living things. To know that humans can have both a positive and negative impact on the environment. Working Scientifically: <u>Using and making simple guides or keys</u> [sorting, grouping, comparing, classifying] to <u>explore</u> and <u>identify</u> local plants and animals. <u>Making a guide</u> [sorting, grouping, comparing, classifying] to local living things. <u>Raising and answering questions</u> based on their <u>observations</u> of animals and what they have found out about other animals that they have <u>researched</u>.	Working Scientifically: <u>Observing and comparing</u> 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 <u>questions</u> and <u>suggesting reasons for similarities & differences</u>. - They might <u>try to</u> grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. <u>Observe changes</u> in an animal over a period of <u>time</u> (for example, by hatching and rearing chicks). <u>Comparing</u> how different animals reproduce and grow.	inhabited the Earth millions of years ago. To know that characteristics are passed from parents to their offspring, but that all offspring vary from their parents. To know that over time, variation in offspring can affect animals' chances of survival in particular environments. To know that animals and plants have adapted to suit their environment over many millions of years and that this process can be called evolution. Working Scientifically: <u>Using classification systems and keys</u> to <u>identify</u> some animals and plants in the immediate environment. <u>Researching</u> unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system. <u>Observing</u> and <u>raising questions</u> about local animals and how they are adapted to the environment; <u>Comparing</u> how some living things are adapted to survive in extreme conditions, for example cactuses, penguins & camels. <u>Analysing the advantages and disadvantages</u> 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.
Key Vocabulary :	Common/local habitats: Pond, farm, jungle, desert, grass, mud, beach etc. Descriptive language for habitats: wet, damp, warm, cold, dry. Comparative language: Warmer/colder, bigger/smaller, wetter/dryer etc.		Animals, plants, habitat/micro-habitat, living/dead/never been alive, suited to, survive, basic needs, food chain, seashore, ocean, woodland, rainforest Expressions to describe location e.g. within, under, next Comparative phrases: smaller than, larger than, longer than, shorter than, more..., long, longer, longest, small, smaller, smallest, similar to, different from Expressions making generalisations e.g. 'most have...'		Words related to life processes e.g. nutrition, habitats and feeding Relationships e.g. habitat, condition, organism, predator, prey, producer, consumer, food chain, key, classify Words which have a different meaning in other contexts e.g. producer, consumer, key, condition Vertebrates and invertebrates, insects, Minibeasts, mammals, reptiles, fish, birds, amphibians (these animal groups may be discussed here but the main focus of this key learning should be introduced in LKS2 'Animals' unit)	Mammals, amphibians, reptiles and plants Live young/eggs, gestation/incubation period, grow, metamorphosis, internal/external sexual reproduction, parental care/no parental care Flowering and non-flowering plants, classifying, classification Reproduction/reproduce, fertilisation/fertilise, germination/germinate, pollination/pollinate, Stamen, style, stigma, sepal, petal, ovary, pollen, Adapted,	Sort, group, identify, classify, environment, suited, classification system, key, habitat <u>Evolution and Inheritance:</u> Evolution, change over time, species, population, features, trait, inherited, reproduce, offspring, variation, mutation, survive/survival/survival of the fittest, adaptation Consumer, producer, predator, prey, food chain, consumer, producer, key, suited
		Everyday Materials	Uses of everyday materials	Rocks and Soil	States of matter	Mixtures and separation Properties and changes	

Materials							
Identifying and naming	BQ- 'What are my clothes made of?' The world (Range 3) Explores objects by linking together different approaches: shaking, hitting, looking, feeling, tasting, mouthing, pulling, turning and poking (Range 5) Talks about why things happen and how things work (Range 6) Knows about similarities and differences in relation to places, objects, materials and living things (Range 6) Talks about the features of their own immediate environment and how environments might vary from one another	BQ- 'What are my clothes made of?' To know that objects are items or things. To know that a material is what an object is made from. To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. To know that property refers to how a material can be described. To describe the physical properties of a variety of everyday materials. To understand that materials can be grouped based on their physical properties. Working Scientifically: Performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'	BQ- 'What is recycling?' To know why objects are made from particular materials and to give examples of their suitability. To know that one material can be used for a range of purposes (and to give examples.) To know that different materials can be used for the same purpose (and to give examples.) To know why certain materials are unsuitable for particular objects. To know that a push or pull must be applied to change the shape of a solid object. To know that solid objects can be squashed, bent, twisted or stretched. To know that different solid objects may take a different amount of force to change shape. Working Scientifically: 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). Observing closely. Identifying and classifying the uses of different materials, and Recording their observations. Thinking about unusual and creative uses for everyday materials.	BQ- 'Can a volcano erupt under the sea?' To know that rocks can be grouped based on their appearance or properties, (e.g. colour, texture, hardness, permeability.) To know that rocks may contain grains, crystals or fossils. To know that grains and crystals appear differently and can be used to classify rocks. To know that soils are made from rocks and dead matter. To understand the relationship between the properties of rocks and their uses. To know that fossils can form from the remains of living things. To know that rocks can change over time (e.g. erosion, weathering) Working Scientifically: Observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time. 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. Research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed 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 are in water [permeability test] Raise and answer questions about the way soils are formed..	BQ- 'Are frozen things always frozen?' To know that all substances around us can exist as solids, liquids and gases. To know that a property of a solid is that it keeps its shape unless a force is applied to it. To know that a property of a liquid can flow freely and take on the shape of a container. To know that a property of a gas does not have a fixed shape and can escape from an unsealed container. To know that heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating). To know that cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing). To know that water can exist as a solid, a liquid or a gas. To know that the melting point of water is zero degrees Celsius and the boiling point of water is 100 degrees Celsius. To know that water flows around the world in a continuous process called the water cycle. To know that in the water cycle, evaporation is when bodies of water are heated and turn into water vapour. To know that in the water cycle, condensation is the process of water vapour cooling to form water droplets in clouds, which can result in precipitation. To know that the rate of evaporation increases as temperature rises. Working Scientifically: Grouping and classifying a variety of different materials. Exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). Researching the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. Observing and recording evaporation over a period of time, such as a puddle in the playground or washing on a line, and investigating the effect of temperature on washing drying or snowmen melting. Grouping and classifying a variety of different materials.	BQ- 'Can mixed materials always be completely separated?' To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets. To know that some substances will dissolve in a liquid to form a solution. To know the factors that affect the time taken to dissolve, including temperature and stirring. To understand that dissolving, mixing and changes of state are reversible changes. To know that some liquids and solids can be separated using sieving, filtering and evaporation and to describe these processes. To understand that some changes result in the formation of new materials and that these are usually irreversible. (e.g. burning, rusting, the action of acid on bicarbonate of soda.) Working Scientifically: Observing and comparing the changes that take place, for example, when burning different materials or baking bread or cakes. Researching and discussing how chemical changes have an impact on our lives, for example cooking, and discuss [research] the creative use of new materials such as polymers, super-sticky and super-thin materials. Carry out tests to answer questions such as 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' Compare materials in order to make a switch in a circuit.	

Key Vocabulary :	Common materials: wood, plastic, paper, glass, stone, sand, water. Words to describe properties: Twist, bend, stretch, shiny, rough, smooth. Comparative language: same, different, more, less.	Common materials: e.g. metal, plastic, wood, paper, glass, clay, rock, brick, fabric, sand, papers, cork, shell, water, elastic, foil Words used to describe materials and their properties e.g. hard/soft, rough/smooth, shiny/dull, bendy/not bendy, stretchy/stiff, waterproof/not waterproof, absorbent/not absorbent, magnetic, transparent, opaque, float, wet, squashy, strong. Words and phrases for making comparisons e.g. the same as, different from, harder, smoother, stretchiest, roughest, etc. Group, sort, sorting rings, describe, compare, because	Common materials: e.g. metal, plastic, wood, paper, glass, clay, rock, brick, fabric, sand, papers, cork, shell, water, elastic, foil Words used to describe materials and their properties recapped from Y1 unit e.g. hard/soft, rough/smooth, shiny/dull, bendy/not bendy, stretchy/stiff, waterproof/not waterproof, absorbent/not absorbent, magnetic, transparent, opaque, float, wet, squashy, strong/breaks easily, wobbly, sticky, uncomfortable Uses of materials, properties of materials Words and phrases for making comparisons e.g. the same as, different from, harder, smoother, stretchiest, roughest, etc. Group, sort, sorting rings, describe, compare, because	Words describing rocks e.g. rock, stone, pebble, slate, marble, chalk, granite, sand, sandstone, hard, texture, grains, crystals, contain fossils, bits pressed together, sedimentary. Words describing soils e.g. darker, lighter, organic matter, leaf litter, grains, clay, sandy, grains. Rub together, break apart/break up, permeable, non-permeable, acid rain, weathering, erosion. Comparison/compare, description/describe. Words which have different meanings in other contexts e.g. test, fair, conclude.	Solid, liquid, gas, property, change, temperature, change state, heated, cooled, temperature, degrees Celsius, water cycle condensation/condense, evaporation/evaporate, melting/melt, freezing/freeze, solidification/solidity, boiling temperature particle, air, carbon dioxide, oxygen, helium, natural gas, viscosity, States of matter Measure, compare, group, research, observe	Words describing the characteristics of materials e.g. strong, hard, flexible, absorbent, transparent, thermal conductor, thermal insulator Words and phrases related to warmth and cold e.g. temperature, thermometer, degrees Celsius Words related to the investigation of these properties e.g. investigate, test, describe, explain, comparison, fair, conclude, evidence Comparison/compare, description/describe Words which have different meanings in other contexts e.g. test, fair, conclude Words associated with rocks: slate, marble, chalk, granite, sand, sandstone, clay, rock, stone, pebble, texture, absorbent, particles, permeable, non-permeable, acid rain	
Energy	BQ- ‘How does it work?’ The world (Range 3) Explores objects by linking together different approaches: shaking, hitting, looking, feeling, tasting, mouthing, pulling, turning and poking Technology (Range 3) Shows interest in toys with buttons, flaps and simple mechanisms and begins to learn to operate them (Range 4) Operates mechanical toys, e.g. turns the knob on a wind-up toy or pulls back on a friction car (Range 5) Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images (Range 5) Plays with a range of materials to learn cause and effect, for example, makes a string puppet using dowels and string to suspend the puppet Working Scientifically Nursery: Observe what happens when a force is applied Talk about what they see happening when force is applied. Working Scientifically Reception: Observe and interact with natural forces			Light - Light and Shadows BQ- ‘What is white light?’ To know that light travels from a source (e.g. the Sun, light bulbs and torches). To know that light is needed to see things and that dark is the absence of light. To know that light from the Sun can be dangerous and how to protect their eyes. To know that all materials reflect light. To know that shadows are formed when the light from a light source is blocked by an opaque object. To know that shadows change as a result of different factors: - Changing the position of the light source. - Changing the distances between the light source, object and surface. To know that shadows change position and length throughout the day as the Sun changes position in the sky. Working Scientifically: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes	Sound – Sound and Vibrations BQ- ‘How does sound travelling impact talking under water?’ To understand that sound is a result of vibrations. To know that vibrations from sounds travel through mediums to the ear. To know that an insulating material reduces the amount of vibrations that pass through it and this can be used to protect the ears from damaging sounds. To know that different materials provide different amounts of insulation against sound. To know a variety of ways to change the pitch or volume of a sound. To know that quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds. To know that stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds. To know that sounds get fainter as the distance from the sound source increases. Working Scientifically: Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses - They might make ear muffs from a variety of different materials to investigate which provides the best insulation against sound. - They could make and play their own instruments by using what		Light - Light and Reflection BQ- ‘What would happen if the light didn’t travel in straight lines?’ - To know that light travels in a straight line from a light source. - To understand that luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye. - To know that shiny surfaces reflect light uniformly. - To know that when light is reflected off a surface, its direction changes. - To know that mirrors and periscopes work using reflection of light on smooth surfaces. - To understand why shadows have the same shape as the objects that cast them as a result of light travelling in straight lines. - To understand relationships between light sources, objects and shadows. - To understand how and why the distance between the object and the screen affects the size of the shadow. - To understand how the angle of a reflected ray is affected by the angle of the incoming ray on a smooth surface. Working Scientifically:

	• <u>Talk about and Describe</u> things they have seen • <u>Know</u> that a force causes a change to occur • <u>Observe and Identify</u> changes caused by a force • <u>Talk about</u> what they see using words such as push, pull, stretch, bend, snap.				<u>they have found out</u> about pitch and volume. • This unit provides an ideal opportunity for <u>using data logging equipment</u> to detect/<u>measure</u> and <u>compare</u> sounds.		• Deciding <u>[observe/explore]</u> where to place rear-view mirrors on cars. • <u>Designing and making</u> a periscope and using the idea that light appears to travel in straight lines to explain how it works. • <u>Investigating the relationship</u> between light sources, objects and shadows by using shadow puppets extend their <u>experience</u> of <u>[explore and observe]</u> 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).
Key Vocabulary :	Push, pull, bend, twist, snap. On, off, working, operating. Button, switch, string, cable			see, seen, light source, eyes, travel, torch shadow, opaque, block reflect, reflection, mirror, direction light travels, straight lines, Comparisons e.g. shortest, highest, furthest, closest	Pitch, loudness, vibrate, vibration, muffle, tuning, quiet, soft, noise, sound, loudness, loud, volume, tension, tight, air, air column, muffle		
Energy Continued:					Electricity – Electricity and Circuits		Electricity – Circuits, batteries and switches.
Sources Transfer Factors affecting energy					BQ- 'Can you see electricity?' • To know that all electrical appliances need a power source, including batteries or mains electricity. • To know that an electrical circuit needs a complete path for the electrical charge to flow through. • To know the main components in a simple series circuit. • To know the precautions for working safely with electricity. • To know that some materials allow electrical charge to pass through them quickly and these are known as electrical conductors (e.g. metals). • To know that some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g. wood and plastic). • To know that metals are used for cables and wires because they are good conductors of electricity. • To know that plastic is used to cover cables and wires because it is a good insulator. • To understand that an open switch breaks a series circuit so the components will be off.		BQ- 'Can you hear electricity?' • To know a wider variety of components in a series circuit (including buzzer and motor). • To know the conventions used to draw circuit diagrams, including the recognised symbols for common components and using straight lines. • To know that the voltage of a circuit can be changed and how this affects bulb brightness (or buzzer volume) Working Scientifically: • Systematically identifying <u>the effect of changing one [thing]</u> component <u>at a time</u> in a circuit. • <u>Designing and making</u> a set of traffic lights, a burglar alarm or some other useful circuit.

					- To understand that a closed switch completes a series circuit so the components will be on. - To understand the relationship between bulb brightness and the number of bulbs in a circuit. Working Scientifically: Observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.		
Key vocabulary:					cell (battery), wire, bulb, bulb holder, buzzer, motor, switch (open/closed), circuit, electrical conductor, electrical insulator, connection, component, break, devices, appliances, mains electricity, safety common materials e.g. metal, wood, plastic Expressions for making suggestions using 'if', 'might', 'could' connection, mains, wire, break Comparative expressions e.g. brighter, less bright (bulbs); faster, slower (motors) Note words which have a different meaning in other contexts e.g. circuit, break, bulb).		cell (battery), wire, bulb, bulb holder, buzzer, motor, switch (open/closed), complete circuit, electrical conductor, electrical insulator, component, circuit symbol, circuit diagram, standard symbols, voltage connection, component, break, fault devices, appliances, mains electricity, safety common materials e.g. metal, wood, plastic Expressions for making suggestions using 'if', 'might', 'could' connection, mains, wire, break Comparative expressions e.g. brighter, less bright (bulbs); faster, slower (motors) Note words which have a different meaning in other contexts e.g. circuit, break, bulb, fault).
Forces Earth and Space	Seasons	Seasonal Changes		Forces and magnets		Earth and Space	
Key Facts	BQ- 'What is the weather telling me?' The world (Range 5) Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world (Range 5) Talks about why things happen and how things work (Range 6) Looks closely at similarities, differences, patterns and change in nature (Range 6) Talks about the features of their own immediate environment and how environments might vary from one another	BQ- 'Does everyone have four seasons?' - To know the name and order of the four seasons; spring, summer, autumn and winter. - To know that it is unsafe to look directly at the Sun. - To know weather associated with the four seasons and how it changes (in the UK). - To understand that day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer.		BQ- 'If magnets stopped working...what would happen?' - To know some examples of contact and non-contact forces. - To know that some forces are a result of contact between two surfaces, but some forces can act at a distance (e.g. magnetism). - To know the North and South poles of a magnet. - To know some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other. - To know some different examples of magnets, including bar, horseshoe, button and ring, - To know some uses of magnets. - To know that friction is a contact force that acts between two surfaces to slow an object down. - To know that magnetism is a non-contact force that		BQ- 'Can you prove that the Earth is not flat?' - To know that the Sun is a star at the centre of our solar system. - To know that the Sun, Earth and Moon are approximately spherical bodies. - To know the names, order and relative positions of the planets and other main celestial bodies. - To know that a moon is a celestial body that orbits a planet and give examples of moons that orbit other planets. - To know that the Earth and other planets orbit around the Sun. - To know that the tilt of the Earth and its orbit around the Sun causes the seasons. - To know that the Moon orbits around the Earth. - To understand how the Earth's rotation causes day and night and the apparent movement of the Sun across the sky.	
Forces in Motion							
Factors affecting forces.	Working Scientifically: Observe and talk about seasonal changes and their impact on familiar animals and plants	Working Scientifically: Making tables and charts about the weather. Making displays of what happens in the world around them, including day length, as the seasons change. : - This unit provides an ideal opportunity for using data					

		<u>logging equipment to record</u> temperatures.		affects objects containing magnetic metal. - To understand that the opposite poles of a magnet attract one another and like poles repel one another. - To know that rougher surfaces have more friction between them than smoother surfaces. - To understand that the strength of different magnets may vary. Working Scientifically: Comparing how different things move and grouping them. 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. Sorting materials into those that are magnetic and those that are not. 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 these properties make magnets useful in everyday items and suggesting creative uses for different magnets.		Working Scientifically: Comparing the time of day at different places on the Earth through internet links and direct communication. Creating simple models of the solar system. Constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day. Finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks. [research]	
Key Vocabulary :	Sun, rain, snow, wind, storm Warm, cold, hot Comparative language: warmer, colder etc.	Autumn, Winter, Spring, Summer, seasons Change, different, temperatures, clothes, activities, record, collect, measure Compare, describe, because		Move, movement: fly, bounce, slide, spin, roll, swirl, swing, forward, backward, upwards, downwards, faster, slower, accelerate, decelerate, ramp, incline push, pull, squeeze, springy, attract, repel, magnetic, non-magnetic, attraction, repulsion, names of common metals (e.g. iron, copper, aluminium), poles, horseshoe magnet, bar magnet, ring magnet, button magnet Stronger / weaker, best / worse		Sphere/spherical, revolve, orbit, spin, rotate, axis, sunrise, sunset, north, south, east, west, rotate around, rotate on its axis Solar system, Sun, Moon, star, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, planet Sundial, shadow clock Model, compare, evidence	
Forces Earth and Space Continued Key Facts Forces in Motion					Imbalanced Forces BQ- 'What if there was no friction?' - To know that gravity is a non-contact force that pulls objects together. - To know that air resistance and water resistance are both types of friction. - To know that unsupported objects fall towards the Earth because of gravity. - To know that friction, air resistance and water		

Factors affecting forces.						resistance act in the opposite direction to a moving object. • To know that when forces are imbalanced, the speed, shape or direction of an object changes. • To know that when forces are balanced the speed, shape or direction of an object stays the same. • To know that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. • To know that rougher surfaces have more friction between them than smoother surfaces and how that may affect movement. • To know that the larger the surface area of an object the greater the air or water resistance it creates. Working Scientifically: • <u>Exploring</u> falling paper cones or cup-cake cases and <u>designing and making [exploring]</u> a variety of parachutes and <u>carrying out fair tests</u> to determine which designs are the most effective. • <u>Exploring</u> resistance in water by <u>making and testing</u> boats of different shapes. • <u>Design and make</u> artefacts that use simple levers, pulleys, gears and/or springs and <u>explore</u> their effects.	
Key Vocabulary :						Friction, air resistance, water resistance, forcemeter, Newtons, surface area, gravity, movement, between surfaces Push, pull, friction, air resistance, water resistance, magnetic forces, gravity, newton, force-meter Direction arrows, size arrows, balanced, unbalanced, force diagram, effect of a force Move, speed up, faster, accelerate, slow down, slower, decelerate, stop, still, stationary, at rest, not moving	