"We believe, we achieve, we succeed in God's family"

THANKFULNESS ● COMMUNITY ● COMPASSION ● TRUTHFULNESS ● COURAGE ● FORGIVENESS

Science Knowledge and Skills Progression Overview

"Equipped with his five senses, man explores the universe around him and calls the adventure Science." Edwin Powell Hubble

Intent	At St Mary's C of E Primary School, we encourage children to be inquisitive throughout their time at the school and beyond. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group. The key knowledge identified by each year group is informed by the national curriculum and builds towards identified phase 'end points' in accordance with NC expectations. Key skills are also mapped for each year group and are progressive throughout the school. These too ensure systematic progression to identified skills end points which are in accordance with the Working Scientifically skills expectations of the national curriculum. The curriculum is designed to ensure that children are able to acquire key scientific knowledge through practical experiences; using equipment, conducting experiments, building arguments and explaining concepts confidently. The school's approach to science takes account of the school's own context, ensuring access to people with specialist expertise and places of scientific interest as part of the school's commitment to learning outside the classroom. Cross curricular opportunities are also identified, mapped and planned to ensure contextual relevance. Children are encouraged to ask questions and be curious about their surroundings and a love of science is nurtured through a whole school ethos and a varied science curriculum.
Implementation STEM LEARNING	Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. Science is taught in planned and arranged topic blocks by the class teacher, to have a project-based approach. This is a strategy to enable the achievement of a greater depth of knowledge. Regular opportunities for retrieval practice is built into the Forest School curriculum to enable children to have first-hand, hands on learning experiences throughout the academic year. Our Forest School environment lends itself to exploring seasonal change, using and discovering properties of materials, plants, habitats, birds and animals.
Impact	The successful approach at St Mary's C of E Primary School results in a fun, engaging, high-quality science education that provides children with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that children learn through varied and first hand experiences of the world around them. Frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum. They learn from and work with professionals, ensuring access to positive role models within the field of science from the immediate and wider local community. At St Mary's we celebrate British Science Week and the Females in Science Day to raise aspirations and inspire young scientists.

National Curriculum Requirements			
EYFS			
Personal, Social and Emotional Development		**Understanding the World**	
ELG: Speaking Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate.	**ELG: Managing Self** Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.	**ELG: People, Culture and Communities** Describe the immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.	**ELG: The Natural World** Explore the natural world around them, making observations and drawing pictures of animals and plants. 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.

KS1	LKS2	UKS2
The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. 'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes	The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. 'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.	The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1.	Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.	'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly.

Characteristics of scientists:

- Great sense of excitement and curiosity about natural phenomena
- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings
- The ability to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes
- Be familiar with, and use, technical terminology accurately and precisely, building up an extended specialist vocabulary
- Apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data

Enrichment Opportunities (this list is not exhaustive)

- Science Week
- Teaching from specialist teachers from William De Ferrers
- Forest School sessions
- Trust Science Competitions
- Exploration through other subjects e.g. DT
- Lego project through STEM
- Extra-curricular activities and clubs

The Path to Success

Step 1: Experience it…

Ensure children experience a rich context for science around the school

Regular opportunities for science teaching of explicit skills

STEM opportunities across the Trust schools

Science skills utilised across the curriculum in other curriculum areas

Children having opportunities to work with specialist science teachers from the secondary school

Step 2: Play with it…

Chance to experiment with science and make predictions

Opportunities to celebrating children's creativity in science week and Trust opportunities

Word association games and follow-on play with vocabulary

Apply 'how could I respond to this situation?' (critical thinking; what could I do differently)

Science 'flash' share something interesting

Step 3: Use it…

Science as stimulus for work in other areas (DT, Maths and Forest School)

Regularity of opportunity—follow the curriculum structure

Range of practice throughout the curriculum to consolidate transferrable skills

Evidence learning: pupil voice, Trust competitions, work in books

Step 4: Develop it…

Collaborate!

Children discussing how science skills and understanding can inform problem solving, creativity and advances in medicine

Discuss global issues such as climate change

Use collaborative activities to enhance vocabulary application and use of scientific language

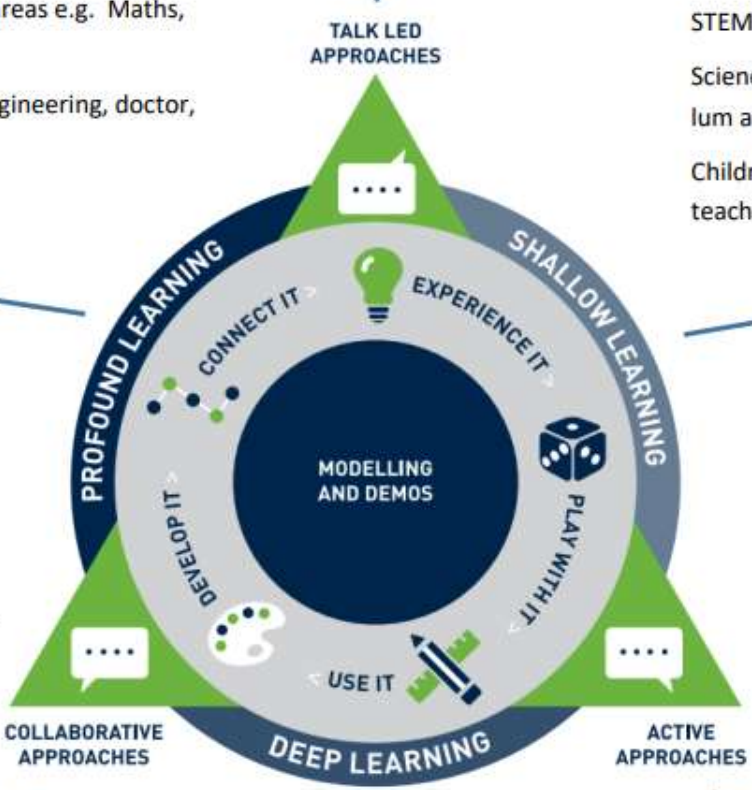
Challenge—set tasks that require pupils to 'teach' about a particular aspect of science such as forces

Step 5: Connect it…

Pupils to apply scientific skills to explore knowledge and predictions in other subjects such as Forest School or DT

Discuss the role of science in other curriculum areas e.g. Maths, DT and Computing

Discuss the role of science in careers such as engineering, doctor, nurse, astronaut



Progression in Science

WORKING SCIENTIFICALLY

EYFS	KS1	LKS2	UKS2
• Notice detailed features of objects in their environment. • Comment and ask questions about aspects of their familiar world such as the place where they live or the natural world. • Talk about some of the things they have observed such as plants, animals, natural and found objects. • Talk about why things happen and how things work. • Develop an understanding of growth, decay and changes over time. • Show care and concern for living things and the environment. • Look closely at similarities, differences, patterns and change.	• Ask simple questions and recognising that they can be answered in different ways • Observe closely, using simple equipment • Perform simple tests • Identify and classify • Use their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions	• Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings	• Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Using test results to make predictions to set up further comparative and fair tests • Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • Identifying scientific evidence that has been used to support or refute ideas or arguments.

Vocabulary

	aim answers	accurate bar chart	accuracy and precision bar graphs

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

BIOLOGY – animals including humans						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Make healthy choices about food, drink, activity and tooth brushing. Begin to make sense of their own life-story and family's history. Understand the key features of the life cycle of a plant and an animal. Learn new vocabulary. Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - tooth brushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.	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) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	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.	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.	Describe the changes as humans develop to old age.	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, including humans.

Vocabulary						
Animal diets: carnivore, herbivore, omnivore. Human body parts: e.g. body, head, neck, arms, elbows, legs, knees, face, ears, eyes, nose, hair, mouth, teeth, hands, feet Names of animal groups: fish, reptiles, birds.	Names of animal groups: fish, amphibians, reptiles, birds, mammals. Animal diets: carnivore, herbivore, omnivore. Human and animal body parts: e.g. body, head, neck, arms, elbows, legs, knees, face, ears, eyes, nose, hair, mouth, teeth, hands, feet, tail, wings, feathers, fur, beak, fins, gills. Human senses: sight, hearing, touch, smell, taste. Exploring senses: loud, quiet, soft, rough. Other: human, animal, pet.	Being born and growing: Young, offspring, live young, grow, develop, change, hatch, lay, fly, crawl, talk. Young and adult names: e.g. lamb and sheep, kitten and cat, duckling and duck. Life cycle stages: e.g. baby, toddler, child, teenager, adult; frogspawn, tadpole, froglet, frog. Survival and staying healthy: basic needs, survive, food, air, exercise, diet, nutrition, healthy, balanced diet, hygiene, germs. Food groups: fruit and vegetables, proteins, dairy and alternatives, carbohydrates, oil and spreads, fat, salt, sugar. Previously introduced vocabulary: water.	Food groups and nutrients: fibre, fats (saturated and unsaturated), vitamins, minerals. Skeletons and muscles: skeleton, muscles, tendons, joints, protection, support, organs, voluntary muscles, involuntary muscles, biceps, triceps, contract, relax, bone, cartilage, shell, vertebrate, invertebrate, endoskeleton, exoskeleton, hydrostatic skeleton. Names of human bones: e.g. skull, spine, backbone, vertebral column, ribcage, pelvis, clavicle, scapula, humerus, ulna, pelvis, radius, femur, tibia, fibula. Other: energy. Previously introduced vocabulary: movement.	Digestive system: digest, digestion, tongue, teeth, saliva, salivary glands, oesophagus, stomach, liver, pancreas, gall bladder, small intestine, duodenum, large intestine, rectum, anus, faeces, organ. Types of teeth and dental care: molar, premolar, incisor, canine, wisdom teeth, tooth decay, plaque, enamel, baby (milk) teeth. Food chains and animal diets: decomposer, food web. Previously introduced vocabulary: producer, consumer, prey, predator, excretion, habitat.	Process of reproduction: gestation, asexual reproduction, sexual reproduction, sperm, egg, cells, clone. Changes and life cycle: embryo, foetus, uterus, prenatal, adolescence, puberty, menstruation, adulthood, menopause, life expectancy, old age, hormones, sweat. Changing body parts: e.g. breasts, penis, larynx, ovaries, genitalia, pubic hair. Previously introduced vocabulary: reproduction, reproduce, types of animals and animal groups, fertilisation.	Circulatory system: circulation, heart, pulse, heartbeat, heart rate, lungs, breathing, blood vessels, blood, pump, transported, oxygenated blood, deoxygenated blood, oxygen, arteries, veins, capillaries, chambers, plasma, platelets, white blood cells, red blood cells. Lifestyle: drug, alcohol, smoking, disease, calorie, energy input, energy output. Other: water transportation, nutrient transportation, waste products. Previously introduced vocabulary: carbon dioxide.

BIOLOGY – Plants						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Plant seeds and care for growing plants.	Identify and name a variety of common wild and garden	Observe and describe how seeds and bulbs	Identify and describe the functions of different parts of			

Learn new vocabulary.	plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.	grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	flowering plants: roots, stem/trunk, leaves and flowers; 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. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
Vocabulary						
Tree Trunk Branch Leaves Flowers Stem Petals Fruit Roots Bulb Seed Fruit Vegetable	Names of common plants: wild plant, garden plant, evergreen tree, deciduous tree, common flowering plant, weed, grass. Name some features of plants: e.g. flower, vegetable, fruit, berry, leaf/leaves, blossom, petal, stem, trunk, branch, root, seed, bulb, soil.	Growth of plants: germination, shoot, seed dispersal, grow, food store, life cycle, die, wilt, seedling, sapling. Needs of plants: sunlight, nutrition, light, healthy, space, air. Name different types of plant: e.g. bean plant, cactus.	Water transportation: transport, evaporation, evaporate, nutrients, absorb, anchor. Life cycle of flowering plants: pollination (insect/wind), pollen, nectar, pollinator, seed formation, seed dispersal (animal /wind/water), reproduce, fertilisation, fertilise, stamen, anther, filament, carpel			

	Name some common types of plant e.g. sunflower, daffodil.	Names of different habitats: e.g. rainforest, desert. Previously introduced vocabulary: water, temperature, warm, hot, cold, habitat.	(pistil), stigma, style, ovary, ovule, sepal, carbon dioxide. Previously introduced vocabulary: life cycle.			
BIOLOGY – Living Things and their Habitats						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Begin to understand the need to respect and care for the natural environment and all living things. Explore the natural world around them, making observations and drawing pictures of animals and plants. 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.		Explore and compare the differences between things that are living, dead, and things that have never been alive. 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 and name a variety of plants and animals in their habitats, including microhabitats. Describe how animals obtain their food from plants and other animals, using the idea		Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things.	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals.	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.

		of a simple food chain, and identify and name different sources of food.				
Vocabulary						
Dead Alive Minibeast Food Woodland Sea shore		Living or dead: living, dead, never living, not living, alive, never been alive, healthy. Habitats including microhabitats: depend, shelter, safety, survive, suited, space, minibeast, air. Life processes: movement, sensitivity, growth, reproduction, nutrition, excretion, respiration. Food chains: food sources, food, producer, consumer, predator, prey. Names of habitats and microhabitats: e.g. under leaves, woodland, rainforest, sea shore, ocean, urban, local habitat. Previously introduced vocabulary: senses, carnivore, herbivore, omnivore, seed, water, names of materials.		Living things: organisms, specimen, species. Grouping living things: classification, classification keys, classify, characteristics. Names of invertebrate animals: snails and slugs, worms, spiders, insects. Invertebrate body parts: e.g. wing case, abdomen, thorax, antenna, segments, mandible, proboscis, prolegs. Environmental changes: environment, environmental dangers, adapt, natural changes, climate change, deforestation, pollution, urbanisation, invasive species, endangered species, extinct. Previously introduced vocabulary: carbon dioxide, fish, bird, mammal, amphibian, reptile, skeleton, bone, vertebrate,	Reproduction: asexual reproduction, sexual reproduction, gestation, metamorphosis, gametes, tuber, runners/side branches, plantlet, cuttings, embryo, adolescent, penis, vagina, egg, pregnancy, gestation. Previously introduced vocabulary: life cycle, pollination, offspring, fertilise, fertilisation, sepal, filament, anther, stamen, pollen, petal, stigma, style, ovary, carpel, ovule, stem, bulb, roots, mammal, adult, baby, sperm, cells, live young.	Classifying: Carl Linnaeus, Linnaean system, flowering and non-flowering plants, variation. Microorganisms: bacteria, single-celled, microbes, microscopic, virus, fungi, fungus, mould, antibiotic, yeast, ferment, microscope, decompose.

				invertebrate, backbone, names for animal body parts, names of common plants, photosynthesis.		
BIOLOGY – Evolution and Inheritance						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
						Recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Vocabulary						
						Evolution and inheritance: evolve, adaptation, inherit, natural selection, adaptive traits, inherited traits, mutations, theory of evolution, ancestors,

						biological parent, chromosomes, genes, Charles Darwin. Other: selective breeding, artificial selection, breed, cross breeding, genetically modified food, cloning, DNA. Previously introduced vocabulary: classification, offspring, characteristics, habitat, environment, adapt, variations, human, fossil, suited, cells, names of different habitats, names of animals and their body parts, species, sedimentary rock, lava, igneous rock, metamorphic rock, magma, heat, fossilisation.
PHYSICS – Seasonal Changes						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Explore the natural world around them. Describe what they see, hear and feel while they are outside. Recognise some environments that are different to the	Observe changes across the 4 seasons. Observe and describe weather associated with the seasons and how day length varies.					

one in which they live. Understand the effect of changing seasons on the natural world around them.						
Vocabulary						
Seasons: spring, summer, autumn, winter, seasonal change. Moon Sun Day length: night, day, daylight.	Seasons: spring, summer, autumn, winter, seasonal change. Weather: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast. Measuring weather: temperature, rainfall, wind direction, thermometer, rain gauge. Day length: night, day, daylight.					
PHYSICS – Forces						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Explore and talk about different forces they can feel.			Compare how things move on different surfaces. Notice that some forces need contact between 2 objects, but magnetic		Explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object.	

			forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. 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. Describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.		Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.	
Vocabulary						
Earth Moon Planet Space Sun Star			How things move: move, movement, surface, distance, strength. Types of forces: push, pull, contact force, non-contact force, friction. Magnets: magnetic, magnetic field,		Types of forces: air resistance, water resistance, buoyancy, upthrust, Earth's gravitational pull, gravity, opposing forces, driving force. Mechanisms: levers, pulleys, gears/cogs.	

			magnetic force, bar magnet, horseshoe magnet, ring magnet, magnetic poles (north pole, south pole), attract, repel, compass. Magnetic and non-magnetic materials: e.g. iron, nickel, cobalt. Previously introduced vocabulary: metal, names of materials.		Measurements: weight, mass, kilograms (kg), Newtons (N), scales, speed, fast, slow. Other: streamlined, Earth. Previously introduced vocabulary: air, heat, moon.	
PHYSICS – Light						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			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. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change.			Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. 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. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Vocabulary						
			Light and seeing: dark, absence of light, light source, illuminate, visible, shadow, translucent, energy, block. Light sources: e.g. candle, torch, fire, lantern, lightning. Reflective light: reflect, reflection, surface, ray, scatter, reverse, beam, angle, mirror, moon. Sun safety: dangerous, glare, damage, UV light, UV rating, sunglasses, direct. Previously introduced vocabulary: opaque, transparent, sunlight, sun.			Reflection: periscope. Seeing light: visible spectrum, prism. How light travels: light waves, wavelength, straight line, refraction. Previously introduced vocabulary: names and properties of materials, absorb

PHYSICS – Sound						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
				Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the		

				object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases.		
Vocabulary						
Loud Quiet Volume Sound				Parts of the ear: eardrum. Making sound: vibration, vocal cords, particles. Measuring sound: pitch, volume, amplitude, sound wave, quiet, loud, high, low, travel, distance. Other: soundproof, absorb sound.		
PHYSICS – Earth & Space						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					Describe the movement of the Earth and other planets relative to the sun in the solar system. 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.	
Vocabulary						
					Solar system: star, planet. Names of planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus. Shape: spherical bodies, sphere. Movement: rotate, axis, orbit, satellite. Theories: geocentric model, heliocentric model, astronomer. Day length: sunrise, sunset, midday, time zone. Previously introduced vocabulary: Sun, moon, shadow, day, night, heat, light, reflect.	
PHYSICS – Electricity						

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. 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. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. 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 Use recognised symbols when representing a simple circuit in a diagram.
Vocabulary						
				Electricity: mains-powered, battery-powered, mains electricity, plug, appliances, devices.		Flow and measure of electricity: voltage, amps, resistance, electrons, volts (V), current.

				Circuits: circuit, simple series circuit, complete circuit, incomplete circuit. Circuit parts: bulb, cell, wire, buzzer, switch, motor, battery. Materials: electrical conductor, electrical insulator. Other: safety. Previously introduced vocabulary: names of materials.		Circuits: symbol, circuit diagram, component, function, filament. Variations: dimmer, brighter, louder, quieter. Types of electricity: natural electricity, human-made electricity, solar panels, power station. Other: positive, negative.
CHEMISTRY – Materials						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about the differences between materials and changes they notice. Understand some important processes and changes in the natural world around	Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties.	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter.	Compare and group materials together, according to whether they are solids, liquids or gases. 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) Identify the part played by evaporation and condensation in the water cycle and associate the rate of	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. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.	

them, including the seasons and changing states of matter.				evaporation with temperature.	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	
Vocabulary						
	Names of materials: wood, plastic, glass, metal, water, rock, paper, cardboard, rubber, fabric.	Changing shape: squash, bend, twist, stretch. Properties of materials: e.g. strong, flexible, light, hard-wearing, elastic.	Types of rock: sedimentary rock, igneous rock, metamorphic rock.	States of matter: solids, liquids, gases, particles. State change: evaporate, condense, melt, freeze, heat, cool,	Properties of materials: thermal conductor /insulator, magnetism, electrical resistance, transparency.	

	Properties of materials: hard, soft, shiny, dull, stretchy, rough, smooth, bendy, not bendy, transparent, opaque, waterproof, not waterproof, absorbent, not absorbent, sharp, stiff. Other: object.	Other: suitability, recycle, pollution.	Properties of rocks: permeable, semi-permeable, impermeable, durable. Names of rocks: e.g. marble, chalk, granite, sandstone, slate. Formation of rocks and fossils: natural, human-made, magma, lava, molten rock, sediment, erosion, fossilisation, layers, bone, fossil. Soil: sandy, chalky, clay, peaty, loamy, topsoil, subsoil, bedrock, mineral, organic matter, compost. Other: palaeontology. Previously introduced vocabulary: soil, water, air.	melting point, freezing point, boiling point, water vapour. Water cycle: precipitation, evaporation, condensation, ground run-off, collection, underground water, bodies of water (sea, river, stream), water droplets, hail. Other: atmosphere. Previously introduced vocabulary: temperature, rain, cloud, snow, wind, sun, hot, cold, absorb, carbon dioxide.	Mixtures and solutions: dissolving, substance, soluble, insoluble. Changes of materials: reversible change, physical change, irreversible change, chemical change, burning, new material, product. Separating: sieving, filtering, magnetic attraction. Previously introduced vocabulary: electrical conductor/insulator, bulb, translucent.	

CYCLE A

TERM		EYFS	Years 1 & 2	Years 3 & 4	Years 5 & 6
Autumn Term	**To work scientifically** This concept involves learning the methodologies of the discipline of science. This is the thread through all scientific disciplines.	Seasonal changes	Y1 POS – Animals including humans	Y3 – POS Rocks Y4 POS – States of Matter	Y6 POS – Evolution and inheritance Y6 POS – Light
Spring Term		Plants	Y1 POS – Plants Y2 POS – Plants	Y3 POS – Forces and Magnets Y4 POS – Sound	Y6 POS – Living things and their habitats Y5 POS – Earth and Space
Summer Term		Seasonal changes Animals including humans	Y1 POS – Seasonal Changes Y2 POS – Animals including humans	Y3 POS – Light Y3 POS – Plants (focus on plants and their needs and how they grow)	Y5 POS – Animals, including humans Y6 POS - Animals including humans

CYCLE B

TERM		EYFS	Years 1 & 2	Years 3 & 4	Years 5 & 6
Autumn Term	**To work scientifically** This concept involves learning the methodologies of the discipline of science. This is the thread through all scientific disciplines.	Materials Seasonal changes	Y1 POS - Everyday materials Y2 POS – Uses of everyday materials	Y4 POS - Living things and their habitats Y4 – States of Matter	Y5 POS - Living things and their habitats
Spring Term		Living things and their habitats	Year 1 POS - Living things and their habitats	Y4 POS - Electricity Y3 POS - Animals, including humans	Y5 POS - Properties & changes of materials Y6 POS - Electricity
Summer Term		Living things and their habitats Plants	Year 2 POS - Living things and their habitats Year 1& 2 POS – Plants	Y3 POS – Plants (focus on life cycles) Y4 POS – Animals including humans	Y5 POS – Forces