Science progression at Braiswick Primary School

"Science is the key to our future, and if you don't believe in science, then you're holding everybody back." Bill Nye

	WORKING SCIENTIFICALLY					
Foundation	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
	ask simple questions and recognise 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.	ask simple questions and recognise 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.	ask relevant questions and use different types of scientific enquiries to answer them set up simple practical enquiries, comparative and fair tests make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identify differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support their findings	ask relevant questions and use different types of scientific enquiries to answer them set up simple practical enquiries, comparative and fair tests make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identify differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support their findings	plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs use test results to make predictions to set up further comparative and fair tests report and present 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 identify scientific evidence that has been used to support or refute ideas or arguments	plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs use test results to make predictions to set up further comparative and fair tests report and present 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 identify scientific evidence that has been used to support or refute ideas or arguments.
look closely, observe, watch, touch, feel, smell, listen, same, different, compare, ask questions, record, sort, group	observe, changes, patterns, grouping, sorting, compare, same, different, identify (name), measure, data, record results, drawing, picture, table, tally chart, present, pictogram, block chart, Venn diagram, ask questions, test, investigate, explore, equipment, resources, magnifying glass, hand lens, ruler, tape measure, metre stick, pipette, syringe, spoon, teaspoon, answer questions, interpret results, scientific enquiry, pattern seeking, comparative testing, observing over time, classifying, researching using secondary sources		practical work, fair testing, relationships, accurate, thermometer, data logger, stopwatch, timer, estimate, data, diagram, identification key, chart, bar chart, prediction, similarity, difference, evidence, information, findings, criteria, values, properties, characteristics, conclusion, explanation, reason, evaluate, improve		variables, independent variable, dependent variable, control variable, evidence, justify, argument (science), causal relationship, accuracy, precision, scatter graphs, bar graphs, line graphs, force meter	

	Foundation Stage	Y1	Y2	Y3	Y4	Y5	Y6
Investigations	Observation: How does our body react to exercise? Experiment: How can we get Baby Bear to the moon? Observation over time: How do the seasons change over time.	Experiment: How can we stop the rain coming in? Observation: How are shadows made? Observation over time: What do plants need to survive?	Experiment: Which material keeps ice frozen for the longest? Observation: How dirty are our hands? Observation over time: The lifecycle of a butterfly.	Experiment: Which magnet is the strongest? Observation: Properties of different rock types Observation over time: Functionality of the parts of a plant Observation over time: Eggshell decay	Experiment: How do objects move on different surfaces? How can I use results to form a conclusion (air resistance context)? Observation: Change of states. Observation over time: Pulse rate investigation.	Observation over time: The Water Cycle Observation: Separating solutions Experiment: How do we amplify sounds?	Observe: Battle of the Beaks Experiment: Cells, buzzers and bulbs – children to plan their own experiment Experiment: Variations of shadows – children to plan their own experiment

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
Plants 	I can name a variety of common wild and garden plants, including deciduous and evergreen trees. I can name the basic structure of a variety of common flowering plants, including trees, and describe their characteristics.	I can name the basic structure of a variety of common flowering plants, including trees, and describe their characteristics. I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees, by matching them to named images and recognising their leaves. I can identify and describe 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.		I can observe and describe how seeds and bulbs grow into mature plants. I can become familiar with plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). I can identify and define the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers and recognise the relationship between structure and function: the idea that every part has a job to do. I know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. I can observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water.			
vocabulary	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area	light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling		photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport			
Common misconceptions	Some children may think: • plants are flowering plants grown in pots with coloured petals and leaves and a stem • trees are not plants • all leaves are green • all stems are green • a trunk is not a stem • blossom is not a flower.	Some children may think: • plants are not alive as they cannot be seen to move • seeds are not alive • all plants start out as seeds • seeds and bulbs need sunlight to germinate.		Some children may think: • plants eat food • food comes from the soil via the roots • flowers are merely decorative rather than a vital part of the life cycle in reproduction • plants only need sunlight to keep them warm • roots suck in water which is then sucked up the stem.			
Scientists	Beatrix Potter - Author & Botanist	Captain Cook- Botanist Agnes Arber - Botanist		Joseph Banks- Botanist Ahmed Mumin Warfa - Botanist George Washington Carver – botanist (peanuts)			

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
Animals, including humans 	I know that animals have offspring which grow into adults. *I can say which part of the body is associated with each sense.*	I can draw and label a basic human body. I know the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets). I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals including those that are kept as pets. I can identify and name a variety of common animals that are carnivores, herbivores and omnivores.	I can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain. I can recognise and describe the importance of exercise and nutrition for humans, eating the right amounts of different types of food, and hygiene.	I know 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. I know the simple functions of the basic parts of the digestive system in humans. I can identify the different types of teeth in humans, their parts and simple functions. I can construct and interpret a variety of food chains, identifying producers, predators (incl. apex predators) and prey.	I know that humans and some other animals have skeletons and muscles for support, protection and movement. I can identify and name the main parts of the human circulatory system, draw diagrams and describe the functions of the heart, blood vessels, blood and lungs. I know the impact of diet, exercise, drugs and lifestyle on the way their bodies function, I know the ways in which nutrients and water are transported within animals, including humans.		I can describe the changes as humans develop to old age.
Vocabulary		head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals experienced first-hand from each vertebrate group, parts of the body including those within the school's RSE policy, senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ear, tongue N.B. The children need to be able to name and identify a range of animals in each group The children also do not need to use the words carnivore, herbivore and omnivore. If they do, ensure that they understand that carnivores eat other animals, not just meat. Although we often use our fingers and hands to feel objects, the children should understand that we can feel with many parts of our body.	offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/hen, kitten/cat, caterpillar/butterfly), survive, survival, water food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy)	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water	Skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine		heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle
Common misconceptions		Some children may think: • only four-legged mammals, such as pets, are animals • humans are not animals • insects are not animals • all 'bugs' or 'creepy crawlies', such as spiders, are part of the insect group • amphibians and reptiles are the same.	Some children may think: • an animal's habitat is like its 'home' • all animals that live in the sea are fish • respiration is breathing • breathing is respiration.	Some children may think: • certain whole food groups like fats are 'bad' for you • certain specific foods, like cheese are also 'bad' for you • diet and fruit drinks are 'good' for you	Some children may think: • your heart is on the left side of your chest • the heart makes blood • the blood travels in one loop from the heart to the lungs and around the body • when we exercise, our heart beats faster to work the muscles more • some blood in our bodies is blue and some blood is red • we just eat food for energy • all fat is bad for you • all dairy is good for you • protein is good for you, so you can eat as much as you want • foods only contain fat if you can see it • all drugs are bad for you.		
Scientists		Chris Packham – Animal conservationist		Marie Curie - Radiation Wilhelm Rontgen - X rays Adelle Davis -Nutritionist Washington & Lucius Sheffield - Toothpaste in a tube Joseph Lister - Antiseptic Ivan Pavlov - Digestive System Mechanisms Leonardo Da Vinci- anatomy	John Boyd Orr – diet and health. (Milk for schools) Santorio Santorio - Anatomist Dr. Katherine Dibb – Expert in Cardiovascular Sciences Justus von Liebig- Theories of Nutrition and Metabolism Sir Richard Doll - Linking Smoking and Health Problems Marie M Daly – Cholesterol		

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
Everyday Materials 	I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.	I can recognise the difference between an object and the material from which it is made. I can describe the simple physical properties of a variety of everyday materials and classify the materials based on the properties, including strength.	I can identify and compare the suitability of the properties of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for insulation. I can identify and discuss the uses of different everyday materials so that they become familiar with how different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). I know the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		I can 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.	I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution I know how mixtures might be separated, including through filtering, sieving and evaporating by using knowledge of solids, liquids and gases. I know that dissolving, mixing and changes of state are reversible changes. I know 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	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through	Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, nonreflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching		solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	
Common misconceptions		Some children may think: • only fabrics are materials • only building materials are materials • only writing materials are materials • the word ‘rock’ describes an object rather than a material • ‘solid’ is another word for hard.	Some children may think: • only fabrics are materials • only building materials are materials • only writing materials are materials • the word rock describes an object rather than a material • solid is another word for hard.			Lots of misconceptions exist around reversible and irreversible changes, including around the permanence or impermanence of the change. There is confusion between physical/chemical changes and reversible and irreversible changes. They do not correlate simply. Chemical changes result in a new material being formed. These are mostly irreversible. Physical changes are often reversible but may be permanent. These do not result in new materials e.g. cutting a loaf of bread. It is still bread, but it is no longer a loaf. The shape, but not the material, has been changed. Some children may think: • thermal insulators keep cold in or out • thermal insulators warm things up • solids dissolved in liquids have vanished and so you cannot get them back • lit candles only melt, which is a reversible change.	
Scientists		William Addis - Toothbrush Inventor **Charles Mackintosh - (Waterproof coat)** **John MacAdam- roads** **John Dunlop – Pneumatic tyres** Chester Greenwood -Earmuffs				Stephanie Kwolek - inventor of Kevlar Mary Anderson – Windscreen wiper	

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
Seasonal Changes 	I know some important processes and changes in the natural world, including the four seasons and changing states of matter (snow, hail, rain, fog etc)	I can collect and present information about the weather, seasons and day length throughout the year.					
Vocabulary	weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length	weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length					
Common misconceptions	Some children may think: • it always snows in winter • it is always sunny in the summer • there are only flowers in spring and summer • it rains most in the winter.	Some children may think: • it always snows in winter • it is always sunny in the summer • there are only flowers in spring and summer • it rains most in the winter.					
Scientists		Dr Steve Lyons (Extreme Weather) Holly Green (Meteorologist)					

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
Living things and their habitats 	I know most living things live in habitats to which they are suited.	I know the basic needs of animals for survival and compare needs and wants.	I know 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. I can identify and name a variety of plants and animals in their habitats, including microhabitats. I know that environments can change naturally and that this can sometimes pose dangers to living things. I can sort and classify things according to whether they are living, dead or were never alive and describe how they decided where to place things. I know that living things can be grouped in a variety of ways and discuss reasons why living things are placed in one group and not another. I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. I can compare the life cycles of a mammal, an amphibian, an insect and a bird.				know 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. I can justify reasons for classifying plants and animals based on specific characteristics. I can describe the life processes of reproduction in some plants and animals.
Vocabulary			living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival, names of local habitats (e.g. pond, woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and microhabitats studied				life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, cuttings Year 6 vertebrates, fish, amphibians, reptiles, birds, mammals, warm-blooded, cold-blooded, invertebrates, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers
Common misconceptions	Some children may think: • fire is living	Some children may think: • an animal's habitat is like its 'home'	Some children may think: • an animal's habitat is like its 'home' • plants and seeds are not alive as they cannot be seen to move • arrows in a food chain mean 'eats'.				Some children may think: • all micro-organisms are harmful • mushrooms are plants.
Scientists			Rachel Carson- Marine Pollution Liz Bonnin - Conservationist				**Carl Linneus - Classification** Libby Hyman - Classification Invertebrates

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
Light 		I know that shadows are formed when the light from a light source is blocked by an opaque object. I can recognise patterns in the way that the size of shadows change. I know that they need light in order to see things and that dark is the absence of light. I know that light is reflected from surfaces. I know that light from the sun can be dangerous and that there are ways to protect their eyes. Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses.					I know that light appears to travel in straight lines. I can use the idea that light travels in straight lines to demonstrate that objects are seen because they give out or reflect light into the eye. I know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. I can use the idea that light travels in straight lines to demonstrate why shadows have the same shape as the objects that cast them and investigate how to change the size of shadows.
vocabulary		Light, light source, Sun, sunlight, dangerous					Light, light source, Sun, sunlight, dangerous, Light, plus straight lines, light rays
Common misconceptions		Some children may think: • we can still see even where there is an absence of any light • our eyes 'get used to' the dark • the moon and reflective surfaces are light sources • a transparent object is a light source • shadows contain details of the object, such as facial features on their own shadow • shadows result from objects giving off darkness.					Some children may think: • we see objects because light travels from our eyes to the object
Scientists		Justus Von Liebig Mirrors James Clerk Maxwell (Visible and Invisible Waves of Light) Hedy Lamarr - Wifi					Thomas Edison - electric light bulb Patricia Bath - saving sight Thomas Young - Wave Theory of Light Ibn al-Haytham - Light and our Eyes (also Space) Percy Shaw - Cats Eye

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
Rocks 				I know that soils are made from rocks and organic matter. I can sequence the formation of fossils when things that have lived are trapped within rock. I can compare and classify different kinds of rocks on the basis of their appearance and simple physical properties.			
Vocabulary				rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, soil, types of soil (e.g. peaty, sandy, chalk, clay)			
Common misconceptions				Some children may think: • rocks are all hard in nature • rock-like, man-made substances such as concrete or brick are rocks • materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural' • certain found artefacts, like old bits of pottery or coins, are fossils • a fossil is an actual piece of the extinct animal or plant • soil and compost are the same thing.			
Scientists				Dr Anjana Khatwa - Geologist Inge Lehrmasn - Earth's Mantle Katia Krafft - Geologist and Volcanologist Zhang Heng – seismometer			

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
Forces and magnets 				I know magnets have 2 poles. I know magnets attract or repel each other and attract some materials and not others. I can demonstrate that some forces need contact between 2 objects, but magnetic forces can act at a distance. I know whether 2 magnets will attract or repel each other, depending on which poles are facing. I can classify a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.	I can 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. I can determine the effects of air resistance, water resistance and friction, that act between moving surfaces. *I can compare how things move on different surfaces.*	I know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. I know that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.	
Vocabulary				Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears		
Common misconceptions				Some children may think: • the bigger the magnet the stronger it is • all metals are magnetic	Some children may think: • forces always act in pairs which are equal and opposite • smooth surfaces have no friction • objects always travel better on smooth surfaces • a moving object has a force which is pushing it forwards and it stops when the pushing force wears out • a non-moving object has no forces acting on it • heavy objects sink and light objects float.	Some children may think: • the heavier the object the faster it falls, because it has more gravity acting on it • forces always act in pairs which are equal and opposite	
Scientists				Andre Marie Ampere- Electro-magnetism	The Wright Brothers - Airplanes Henry Ford – the motor cars/assembly line	Isaac Newton – Gravity, laws of motion Albert Einstein - The Theory Of relativity Galileo Galilei - Gravity and Acceleration Archimedes of Syracuse – Levers (and water displacement)	

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
States of matter 			I know the temperature at which materials change state in degrees Celsius (°C). I know that some materials change state when they are heated. I know that some materials change state when they are cooled.		I can classify materials, according to whether they are solids, liquids or gases.	I know the part played by evaporation and condensation in the water cycle. I can associate the rate of evaporation with temperature.	
Vocabulary			Boiling, boiling point, temperature,		solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle		
Common misconceptions			Some children may think: • all liquids boil at the same temperature as water (100 degrees)		Some children may think: • 'solid' is another word for hard or opaque • solids are hard and cannot break or change shape easily and are often in one piece • substances made of very small particles like sugar or sand cannot be solids • particles in liquids are further apart than in solids and they take up more space • when air is pumped into balloons, they become lighter • water in different forms – steam, water, ice – are all different substances • all liquids boil at the same temperature as water (100 degrees) • melting, as a change of state, is the same as dissolving • steam is visible water vapour (only the condensing water droplets can be seen) • clouds are made of water vapour or steam • the substance on windows etc. is condensation rather than water • the changing states of water (illustrated by the water cycle) are irreversible • evaporating or boiling water makes it vanish • evaporation is when the Sun sucks up the water, or when water is absorbed into a surface/material.		
Scientists			Lord Kelvin - Absolute zero (temperature)		Joseph Priestly – Discovered oxygen Anders Celsius - Temperature Scale Daniel Fahrenheit Temperature Scale / Invention of the Thermometer		

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
Sound 						I know how sounds are made, associating some of them with something vibrating. I know how sound travels and establish that vibrations from sounds travel through a medium to the ear. I can measure sound over distance and appreciate that sounds get fainter as the distance from the sound source increases. I can find patterns between the pitch of a sound and features of the object that produced it. I can find patterns between the volume of a sound and the strength of the vibrations that produced it.	
Vocabulary						Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation	
Common misconceptions						Pitch and volume are frequently confused, as both can be described as high or low. Some children may think: • sound is only heard by the listener • sound only travels in one direction from the source • sound can't travel through solids and liquids • high sounds are load and low sounds are quiet.	
Scientists						Alexander Graham Bell -Invented the telephone Aristotle - Sound Waves Gailileo Galilei - Frequency and Pitch of Sound Waves	

	Foundation stage	***Y1***	***Y2***	***Y3***	***Y4***	***Y5***	***Y6***
Electricity 				I can identify common appliances that run on electricity. I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs. I know 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. I know some common conductors and insulators, and associate metals with being good conductors.			I know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. I can use recognised symbols when representing a simple circuit in a diagram. I can associate the brightness of a lamp or the volume of a buzzer with the number of cells used in the circuit. I can compile reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. I can construct simple series circuits, to help answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. Note: pupils are expected to learn only about series circuits, not parallel circuits.
Vocabulary				Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.			Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage N.B. Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words “cells” and “batteries” are now used interchangeably.
Common misconceptions				Some children may think: • electricity flows to bulbs, not through them • electricity flows out of both ends of a battery • electricity works by simply coming out of one end of a battery into the component.			Some children may think: • larger-sized batteries make bulbs brighter • a complete circuit uses up electricity • components in a circuit that are closer to the battery get more electricity.
Scientists				Michael Faraday - relationship between magnets and electricity Thomas Edison- Lightbulb Joseph Swan - Incandescent Light Bulb			Nikola Telsa - AC electric system Alessandro Volta - Electrical Battery Nicola Tesla - Alternating Currents Edith Clarke - Electrical engineer

	Foundation stage	Y1	Y2	Y3	Y4	Y5	Y6
Earth and space 						I can use the idea of the Earth's rotation to define day and night and the apparent movement of the sun across the sky. I can summarise the movement of the Earth and other planets relative to the sun in the solar system. I can summarise the movement of the moon relative to the Earth. I know the sun, Earth and moon as approximately spherical bodies.	
Vocabulary						Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit	
Common misconceptions						Some children may think: • the Earth is flat • the Sun is a planet • the Sun rotates around the Earth • the Sun moves across the sky during the day • the Sun rises in the morning and sets in the evening • the Moon appears only at night • night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.	
Scientists						Margaret Hamilton - Computer scientist (Moon Landings) Stephen Hawking - Black Holes Mae Jemison – Astronaut Maggie Aderin Pocock - Astronomy Claudius Ptolemy and Nicolaus Copernicus - Heliocentric vs Geocentric Universe Neil Armstrong - First man on the Moon Helen Sharman - first GB astronaut *Caroline Herschel - comets* *Jocelyn Bell Burnell - Pulsars* Valentina Tereshkova - Cosmonaut	

	Foundation stage	Y1	Y2	Y3	Y4	Y5	Y6
Evolution and inheritance 							I know that living things have changed over time, including the evolution of man, and that fossils provide information about living things that inhabited the Earth millions of years ago. I know animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. I know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
Vocabulary							offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils, evolve, evolution
Common misconceptions							Some children may think: • adaptation occurs during an animal's lifetime: giraffes' necks stretch during their lifetime to reach higher leaves and animals living in cold environments grow thick fur during their life • offspring most resemble their parents of the same sex, so that sons look like fathers • all characteristics, including those that are due to actions during the parent's life such as dyed hair or footballing skills, can be inherited • cavemen and dinosaurs were alive at the same time.
Scientists							Hippocrates -The Father of Medicine Charles Darwin - Evolution Alfred Russell Wallace – evolution Rosalind Franklin – DNA Nettie Stevens – Geneticist Professor Alice Roberts - Evolutionary biologist Barbara McClintock – Geneticist Mary Anning - Fossil hunter William Smith - Fossils strata