



Science Progression								
Working Scientifically								
Early Learning Goal	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
	Asking simple questions and recognising that they can be answered in different ways.		Asking relevant questions and using different types of scientific enquiries to answer them.		Planning different types of scientific enquiries to answer questions , including recognising and controlling variables where necessary.			
	Ask simple questions.	Ask simple questions and recognise that they can be answered in different ways.	Ask simple, relevant questions and use scientific enquiries to answer them.	Ask relevant questions and use different types of scientific enquiries to answer them.	Plan scientific enquiries to answer questions.	Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience	
	Performing simple tests .		Setting up simple practical enquiries, comparative and fair tests.					
	Perform simple tests, with support.	Perform simple tests.	Set up simple practical enquiries, comparative and fair tests, with support.	Set up simple practical enquiries, comparative and fair tests.			Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate	



	Observing closely, using simple equipment.		Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.		Taking measurements , using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.		
ELG - Explore the natural world around them, making observations and drawings.	Observe using simple equipment.	Observe closely using simple equipment.	Make careful observations and, where appropriate, take measurements using standard units, using a range of equipment.	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	Take measurements, using a range of scientific equipment, with increasing accuracy and precision.	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	<p>Make and record observations and measurements using a range of methods for different investigations.</p> <p>Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.</p> <p>Evaluate the reliability of methods and suggest possible improvements.</p>
	Identifying and classifying .		Identifying differences, similarities or changes related to simple scientific ideas and processes.				
ELG - Know some similarities and differences between the natural world around them and contrasting	Identify and group things they observe, with support.	Identify and classify things they observe.	Identify changes that relate to simple scientific ideas, when prompted.	Identify differences, similarities or changes related to simple scientific ideas and processes.			



environments, drawing on their experiences.							
	Gathering and recording data to help in answering questions.		Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.				
	Gather and record simple data.	Gather and record data to help in answering questions.	Gather, record, classify and present data in a variety of ways.	Gather, record, classify and present 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.		Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.		
			Record findings using simple scientific language, drawings, labelled diagrams and tables.	Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	Record data and results using scientific diagrams and labels, classification keys, tables, bar and line graphs.	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	Present observations and data using appropriate methods, including tables and graphs. Apply mathematical concepts and calculate results.



			Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.		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.		
			Report on findings from enquiries, including oral and written explanations.	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	Report and present findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations.	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.	Present reasoned explanations, including explaining data in relation to predictions and hypotheses. Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions.
	Using their observations and ideas to suggest answers to questions.		Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.		Using test results to make predictions to set up further comparative and fair tests.		
ELG Understand some important processes and changes in the natural world around them.	Use their observations and ideas to suggest answers to questions, with support.	Use their observations and ideas to suggest answers to questions.	Use results to draw simple conclusions and raise further questions.	Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	Use test results to make predictions to set up further tests.	Use test results to make predictions to set up further comparative and fair tests.	Identify further questions arising from any results.



		Using straightforward scientific evidence to answer questions or to support their findings.	Identifying scientific evidence that has been used to support or refute ideas or arguments.		
		Use scientific evidence to answer questions.	Use scientific evidence to answer questions or to support their findings.	Identify scientific evidence that has been used to support or disprove ideas.	Identify scientific evidence that has been used to support or refute ideas or arguments.
	<i>Pupils should read and spell scientific vocabulary at a level consistent with their increasing word and spelling knowledge at Key Stage One.</i>	<i>Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.</i>	<i>Pupils should read, spell and pronounce scientific vocabulary correctly.</i>		



BIOLOGY

Plants

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
	<p>Extend vocabulary: blossom, buds, bulb, evergreen, deciduous</p> <p>Describe what they see, hear & feel whilst outside</p> <p>Name & describe some plants</p> <p>Draw pictures of plants</p>	<p>identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p>		<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p>				<p>The importance of plant reproduction through insect pollination in human food security</p>
<p>Observe plants closely through a variety of means e.g. magnifiers & photographs</p> <p>Extend vocabulary: leaves, petals, roots, bulb, trunk, branches, stem, garden plants, wild plants, seeds</p> <p>Use all the senses in hands-on exploration of plants</p>	<p>Extend vocabulary: blossom, buds, bulb, evergreen, deciduous</p> <p>Describe what they see, hear & feel whilst outside</p> <p>Name & describe some plants</p> <p>Draw pictures of plants</p>	<p>Identify and describe the basic structure of a variety of common flowering plants, including trees</p>		<p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</p>				<p>Nutrition & Digestion: Plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots</p>



<p>All plants need water & light to grow & survive</p>	<p>All plants need water, light and warmth to grow and survive</p> <p>A seed produces roots to allow water to get into the plant and shoots to produce leaves to collect the sunlight</p>		<p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>Investigate the way in which water is transported within plants</p>				<p>Photosynthesis: Dependence of almost all life on the ability of photosynthetic organisms such as plants and algae to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and CO₂ in the atmosphere</p> <p>Adaptation of leaves</p> <p>Word summary for photosynthesis – reactants/products</p>
<p>Most plants start growing from a seed or bulb</p> <p>Understand the key features of the life cycle of a plant</p>			<p>Observe and describe how seeds and bulbs grow into mature plants</p>	<p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>		<p>Describe the life process of reproduction in some plants (and Animals, including humans)</p>		<p>Reproduction: Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of dispersal mechanisms</p>



Biology Living Things and their habitats:

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
<p>Observe growth & decay over time</p> <p>Talk about what they see, using a wide vocabulary</p>	<p>Examine change over time</p> <p>Describe what they see, hear & feel whilst outside</p>		<p>Explore and compare the differences between things that are living, dead, and things that have never been alive.</p>		<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p>		<p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants, and animals</p>	
<p>Explore different habitats outdoors, e.g. scent, colour & shape of flowers attracting bees</p> <p>Begin to understand the need to respect & care for the natural environment & all living things</p>	<p>Discuss how to care for the living things & their habitats</p> <p>Express opinions on natural & built environments & opportunities to hear different points of view on the quality of the environment. Use words such as busy, quiet, pollution</p>		<p>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</p>		<p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>		<p>Give reasons for classifying plants and animals based on special characteristics</p>	<p>Interactions and interdependencies Relationships in an ecosystem: How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.</p>



Explore different habitats outdoors, e.g. scent, colour & shape of flowers attracting bees	Observational drawings of the natural world		Identify and name a variety of plants and animals in their habitats, including micro-habitats.			Describe the life process of reproduction in some plants and animals		The role of variation in enabling living things to survive in the same ecosystem
			Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain , and identify and name different sources of food.	Construct and interpret a variety of food chains , identifying producers, predators and prey.				The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops as examples
								Cells and organisation: Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope.
								The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts.
								Similarities and differences between plant and animal cells



									The role of diffusion in the movement of materials between cells
									The structural adaptations of some unicellular organisms
									The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms
									Cellular respiration aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life a word summary for aerobic respiration the process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism.



Biology Animals, including humans								
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
Observe animals closely through a variety of means e.g. magnifiers & photographs	Talk about things they have observed including animals Observational drawings of animals	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals						
Name & identify body parts	Identify different parts of their body & animals	Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)						
		Identify and name a variety of common animals that are carnivores, herbivores and omnivores		Identify that Animals, including humans, 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.				Calculations of energy requirements in a healthy diet Consequences of imbalances in the diet, including obesity, starvation and deficiency diseases.



	Be able to show care and concern for living things		Find out about and describe the basic needs of Animals, including humans, for survival (water, food and air)				Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	Health: The effects of recreational drugs (including substance misuse) on behaviour, health and life processes.
Look at key stages of development from birth to adult. Understand the key features of the life cycle of a butterfly	Have some understanding of growth and change Observe how flora & fauna behave differently as the seasons change Use correct terms e.g. chrysalis, pupa when observing life cycle of butterfly & ladybirds		Notice that animals, including humans, have offspring which grow into adults			Describe the changes as humans develop from birth to old age From 'Living things and habitats': Describe the life processes of reproduction in some Animals, including humans From 'Living things' Describe the differences in the life cycles of mammal, amphibian, insect & bird		Reproduction in humans (as an example of a mammal) including structure and function of male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include effect of maternal lifestyle on the foetus through the placenta.
Name & identify body parts	Identify different parts of their body & animals Describe what they see, hear & feel	Identify, name, draw and label the basic parts of the human body and say		Identify that humans and some other animals have skeletons and				The skeletal and muscular systems: The structure and functions of the human skeleton, to include support,



		which part of the body is associated with each sense.		muscles for support, protection and movement				protection, movement and making blood cells Biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles The function of muscles and examples of antagonistic muscles
					Identify the different types of teeth in humans and their simple functions			The importance of bacteria in the human digestive system
					Describe the simple functions of the basic parts of the digestive system in humans			The tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food
							Describe the ways in which nutrients and water are transported within Animals, including humans,	Gas exchange systems: Structure and functions of the gas exchange system in humans, including adaptations to function Mechanism for breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume The impact of exercise, asthma and smoking on the human gas exchange system See also section on cellular respiration
							Identify and name the main parts of the circulatory system , and explain the functions of the heart, blood vessels and blood.	



Observe & describe in words or actions the effects of physical activity on body	Shows some understanding that good practices with regard to exercise, eating, drinking water, sleeping & hygiene can contribute to good health Know the effects exercise has on their bodies		Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.					Nutrition and digestion: Content of a healthy diet: carbohydrates, lipids (fats & oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed.
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Biology Evolution & Inheritance								
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
							Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction .
				From 'Rocks' Describe in simple terms how fossils are formed when things that have lived are trapped within rock.			Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.	The variation between individuals of different species The variation between individuals within a species being continuous or discontinuous, to include measurements and graphical representation of variation.
								Heredity as the process by which genetic information is transmitted from one generation to the next The importance of maintaining biodiversity and use of gene banks to preserve heredity material
							Identify how Animals, including humans and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	a simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model



CHEMISTRY

Rocks

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
				<p>Compare and group together different kinds of rocks on the basis of their simple physical properties</p> <p>Recognise that that soils are made from rocks and organic matter</p>				<p>Earth and Atmosphere</p> <ul style="list-style-type: none"> - the composition of the Earth -the structure of the Earth -the rock cycle and the formation of igneous, sedimentary and metamorphic rocks
				<p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p>				<ul style="list-style-type: none"> -Earth as a source of limited resources and the efficacy of recycling -The carbon cycle -The composition of the atmosphere -The production of carbon dioxide by human activity and the impact on climate.



Chemistry - Materials								
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
<p>Talk about what they see, using a wide vocabulary</p> <p>Characteristics of liquids & solids e.g. cooking eggs, melting chocolate</p>		<p>Distinguish between an object and the material from which it is made</p>			<p>Compare and group materials together, according to whether they are solids, liquids or gases</p>	<p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p>		
<p>Explore collections of materials with similar and/or different properties</p>		<p>Identify and name a variety of everyday materials, including wood, metal, plastic, glass, metal, water and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials</p>			<p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C),</p>			<p>The particulate nature of matter</p> <ul style="list-style-type: none"> - the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure -changes of state in terms of the particle model. <p>Energetics</p> <ul style="list-style-type: none"> -energy changes on changes of state (qualitative) -exothermic and endothermic chemical reactions (qualitative).



Use all their senses in hands-on exploration of natural materials	Use vocabulary to name specific features of the natural world, both natural & man-made	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			Give reasons , based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic		Materials -the order of metals and carbon in the reactivity series -the use of carbon in obtaining metals from metal oxides -properties of ceramics, polymers and composites (qualitative).
Explore & talk about different forces they can feel e.g. stretch, snap, rigid, magnetic repulsion, water pushing up when pushing a boat under it			(Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching)		Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature			
Talk about the differences between materials and changes they notice e.g. cooking, melting, shadows, floating & sinking	Observe & interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object & a boat floating on water					Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Demonstrate that dissolving , mixing and changes of state are reversible changes .		Pure and impure substances - the concept of a pure substance -mixtures, including dissolving -diffusion in terms of the particle model -the identification of pure substances.



						Use knowledge of solids, liquids and gases to decide how mixtures might be separated , including through filtering, sieving and evaporating		Pure and impure substances Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography
								Atoms, Elements, Compounds -A simple (Dalton) atomic Model -Differences between atoms, elements and compounds -Chemical symbols and formulae for elements and compounds -Conservation of mass in changes of state and chemical reactions
								Periodic table: -The varying physical and chemical properties of different elements -The principles underpinning the Mendeleev Periodic Table -The Periodic Table: periods and groups; metals and non-metals. -How patterns in reactions can be predicted with reference to the Periodic Table. - The chemical properties of metal and non-metal oxides with respect to acidity.
						Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes		-Chemical reactions as the rearrangement of atoms. -Representing chemical reactions using formulae and equations - Combustion, thermal decomposition, oxidation and displacement reactions



						associated with burning and the action of acid on bicarbonate of soda		<ul style="list-style-type: none"> - The pH scale for measuring acidity/alkalinity, and indicators - Reactions of acids with metals to produce a salt plus hydrogen - Reactions of acids with alkalis to produce a salt plus water - What catalysts do
								Matter: Physical changes <ul style="list-style-type: none"> - conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving - similarities and differences, including density differences, between solids, liquids and gases - Brownian motion in gases - diffusion in liquids and gases driven by differences in concentration - the difference between chemical and physical changes.
								Matter: Particle model <ul style="list-style-type: none"> - the differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition - atoms and molecules as particles. Energy in matter <ul style="list-style-type: none"> - changes with temperature in motion and spacing of particles - internal energy stored in materials.



PHYSICS

Forces and Magnets

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
				Compare how things move on different surfaces				<p>Describing motion:</p> <ul style="list-style-type: none"> -Speed and the quantitative relationship between average speed, distance and time (speed = distance /time) -the representation of a journey on a distance-time graph -relative motion: trains and cars passing one another. <p>Forces and motion:</p> <ul style="list-style-type: none"> -Forces being needed to cause objects to stop or start objects moving, or to change their speed or direction of motion -Change depending on direction of force and its size
								<p>Pressure in fluids:</p> <ul style="list-style-type: none"> -Atmospheric pressure decreases with increase of height as weight of air above decreases with height -Pressure in liquids increases with depth, upthrust effects, floating and density -Pressure measured by ratio of force over area – acting normal to any surface
				Recognise that some forces need contact between two objects, but magnetic forces can act at a distance		Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object		<p>Energy: simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged</p> <p>Forces:</p> <ul style="list-style-type: none"> -Forces as pushes and pulls, arising from the interaction between two objects -Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces



						Identify the effects of air resistance, water resistance and friction, that act between moving surfaces		<ul style="list-style-type: none"> - Moment as the turning effect of a force - Forces: associated with deforming objects, stretching and squashing – springs. - Forces measured in newtons, measurements of stretch or compression as force is changed - Forces: associated with rubbing and friction between surfaces, with pushing things out of the way, resistance to motion of air and water. - Force-extension linear reaction: Hooke's Law as a special case. - Work done and energy changes on deformation - non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity.
Explore how things work e.g. pulleys.						Recognise that some mechanisms, including gears, pulleys, levers and springs, allow a smaller force to have a greater effect		<ul style="list-style-type: none"> - Force-extension linear reaction: Hooke's Law as a special case. - Work done and energy changes on deformation - non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity. <p>Balanced forces: Opposing forces and equilibrium: weight held by a stretched spring or supported on a compressed surface</p>
				Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.				
				Recognise that some forces need contact between two objects and some forces act at a distance				



				Observe how magnets attract or repel each other and attract some materials and not others				
				Describe magnets as having two poles				
				Predict whether two magnets will attract or repel each other, depending on which poles are facing				-Magnetic poles: attraction and repulsion -Magnetic fields by plotting with compass, representation by field lines -Earth's magnetism, compass and navigation -The magnetic effect of a current, electromagnets, D.C. Motors (principles only)



Physics - Light								
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
				Understand that light is reflected from surfaces			Recognise that light appears to travel in straight lines	- the similarities and differences between light waves and waves in matter - light waves travelling through a vacuum; speed of light
				Recognise that light from the sun can be dangerous and that there are ways to protect their eyes			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	-the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface
				Recognise that they need light in order to see things and that dark is the absence of light			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 of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye
				Recognise that shadows are formed when the light from a light source is blocked by a opaque object Find patterns in the way that the size of shadows change.			Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	-light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras
								colours and the different frequencies of light, white light and prisms .



Physics - Sound

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
					<p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</p>			<p>Observed waves: Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel - superposition</p>
					<p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p>			<p>Sound waves: -Frequencies of sound waves, measured in Hertz (Hz), echoes, reflection and absorption of sound -Sound needs a medium to travel, the speed of sound in air, water and solids - Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum, sound waves are longitudinal -Auditory range of humans and animals</p>
					<p>Recognise that sounds get fainter as the distance from the sound source increases</p>			
								<p>Energy and waves: Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound; waves transferring information for conversion to electrical signals by microphone.</p>



Physics - Electricity								
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
					Identify common appliances that run on electricity			Static electricity: <ul style="list-style-type: none"> • Separation of positive or negative charges when objects are rubbed together; transfer of electrons, forces between charged particles • the idea of electric field, forces acting across the space between objects not in contact.
					Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers		Use recognised symbols when representing a simple circuit in a diagram	Current electricity: Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current flow as charge
					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		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	Potential difference, measured in volts, battery and bulb ratings, resistance measured in ohms, as the ratio of p.d. to current



					Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series 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.	From energy section: <ul style="list-style-type: none"> • comparing power ratings of appliances in watts (W, kW) • comparing amounts of energy transferred (J, kJ, kW hour) domestic fuel bills, fuel use and costs
					Recognise some common conductors and insulators, and associate metals with being good conductors.			Differences in resistance between conducting and insulating components (quantitative)



Physics - Earth and Space (Seasonal changes)								
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7+
	Understand the effect of changing seasons on the natural world around them	Seasonal changes: Observe changes across the four seasons				Describe the movement of the Earth and other planets relative to the Sun in the solar system		
		Observe and describe weather associated with the seasons and how day length varies.				Describe the movement of the Moon relative to the Earth		
						Describe the Sun, Earth and Moon as approximately spherical bodies		Our sun as a star, other stars in our galaxy, other galaxies
						Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.		The seasons and the Earth's tilt, day length at different times of year, in different hemispheres
								The light year as a unit of astronomical distance.
								Gravity force, weight = mass x gravitational field strength (g), on earth $g=10 \text{ N/kg}$, different on other planets and stars; gravity forces between earth and moon, and between earth and sun