Elvington Church of England Primary School

Progression of Skills and Knowledge for Science

Working Scientifically

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Asking Questions -Answer 'how' and 'why' questions about their experiences and in response to stories or events.	**Asking Questions** -Ask simple questions and recognise they can be answered in different ways.		**Asking Questions** -Ask relevant questions and use different types of scientific enquiries to answer them. -Set up simple practical enquiries, comparative and fair tests		**Asking Questions** -Plan different types of scientific enquiries to answer questions. -Recognise and control variables where necessary -Explore and talk about their ideas; asking their own questions about scientific phenomena.	
Monitoring and Recording -Make observations of animals and plants and explain why some things occur, and talk about changes.	**Monitoring and Recording** -Observe closely, using simple equipment. -Perform simple tests. -Gather and record data to help in answering questions. *Identify and classify		**Monitoring and Recording** -Make systematic and careful observations. -Take accurate measurements using standard units, using a range of equipment (e.g. thermometers and data loggers). -Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. -Gather, record, classify and present data in a variety of ways to help in answering questions.		**Monitoring and Recording** -Make accurate measurements, using a range of scientific equipment with increasing accuracy and precision. -Take repeat readings when appropriate to consider fair tests. -Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	
Concluding -Talk about the features of their own immediate environment and how environments might vary from one another.	**Concluding** -Use their observations and ideas to suggest answers to questions. -Use age-appropriate scientific language -Begin to notice patterns and relationships.		**Concluding** -Identify similarities, differences or changes related to simple scientific ideas and processes. -Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. -Use straightforward scientific evidence to answer questions or support findings. *Begin to look for naturally occurring patterns and relationships.		**Concluding** -Identify scientific evidence that has been used to support or refute ideas or arguments. -Report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. -Draw conclusions based on their data and observations, use evidence to justify their	

		-Use, spell and read scientific vocabulary correctly.	ideas and use their scientific knowledge to explain their findings. *Use, spell, read and pronounce scientific vocabulary correctly.
Evaluating -Children know about similarities and differences in relation to places, objects, materials and living things.	**Evaluating**	**Evaluating** -Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions -Begin to recognise when and how secondary resources might help them to answer questions that cannot be answered through practical investigation.	**Evaluating** - Test results to make predictions to set up further comparative and fair tests. -Recognise that scientific ideas change and develop over time.
Related National Curriculum Objectives in italics:	*-asking simple questions and recognising that they can be answered in different ways* *-observing closely, using simple equipment* *-performing simple tests* *-identifying and classifying* *-using their observations and ideas to suggest answers to questions* *-gathering and recording 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*	*-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 a 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*

		-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.*	

Light and Sound					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		Light	**How Sound Is Made, Travels and Can Be Changed**		**Light and How We See**
		-There must be light for us to see. Without light it is dark. -Light comes from a source. -We need light to see things even shiny things. -Transparent materials let light through them and opaque materials don't let light through. -Beams of light bounce off some materials (reflection). -Shiny materials reflect light beams better than non-shiny materials	-Sound travel can be blocked. *Sound spreads out as it travels. -Changing the shape, size and material of an object will change the sound it produces. -Sound is produced when an object vibrates. -Changing the way an object vibrates changes it's sound. -Sound moves through all materials by making them vibrate. -Bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds. -Faster vibrations (higher frequencies) produce higher pitched sounds.		-Light travels in straight lines. -Light reflects of all objects (unless they are black). Non-shiny surfaces scatter the light so we don't see a single beam. -Animals see light sources when light travels from the source into their eyes. -Animals see objects when light is reflected off that object and enters their eyes

		-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*	*-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*		*-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.*

Electricity					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			Making Electrical Circuits Work		**Controlling Electrical Circuits**
			-A source of electricity (mains or battery) is needed for electrical devices to work. - A complete circuit is needed for electricity to flow and devices to work. -Electricity sources push electricity round a circuit.		-Batteries are a store of energy. This energy pushes electricity round the circuit. When the battery's energy is gone it stops pushing. Voltage measures the 'push'. -Current is how much electricity is flowing round a circuit. -The greater the current flowing through a device the harder it works.

			-More batteries will push the electricity round the circuit faster. -Some materials allow electricity to flow easily and these are called conductors. Materials that don't allow electricity to flow easily are called insulators. -Devices work harder when more electricity goes through them		-When current flows through wires heat is released. The greater the current the more heat is released.
			-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*		*-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*

			-recognise some common conductors and insulators, and associate metals with being good conductors		

Earth and Space

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				Earth and Space	
				-Stars, planets and moons have so much mass they attract other things, including each other due to a force called gravity. Gravity works over a distance. -Stars produce vast amounts of heat and light. All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars. -Objects with larger masses exert bigger gravitational forces -Objects like planets, moons and stars spin -Smaller mass objects like planets orbit large mass objects like stars	
				-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*	

Forces

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Pushes, Pulls and Their Effects **Magnets and Their Effects**		**Forces That Oppose Motion**	

-		- Objects move in different ways; they roll, slide, bounce etc. -**Forces change how things move.** We can change the way an object moves by pushing or pulling them. Sometimes pushing and pulling slows things down, sometimes it speeds them up and sometimes it makes it change direction. -Bigger pushes and pulls have bigger effects. -**Objects move differently on different surfaces** -Rough surfaces create friction and slow moving objects down. -Forces change shapes. -Sometimes when an object is pushed, pulled or twisted it changes shape. -Magnets exert attractive forces on some materials. -Magnets exert attractive and repulsive forces on each other. -Magnets exert non-contact forces, which work through some materials. -Magnetic forces are affected by the magnets strength. -Magnetic forces are affected by the mass of the object being attracted. -Magnetic forces are affected by the distance between magnet and object.		- Air resistance and water resistance are forces against motion caused by objects having to move air and water out of the way. -Friction is a force against motion caused by two surfaces rubbing against each other -Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move.	
		-compare how things move on different surfaces *-notice that some forces need contact between 2 objects, but magnetic 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*		*-explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object* *-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*	

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Plants						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	How Do Plants Grow?	**Making New Plants**	**How Plants Make Their Food** **How Plants Reproduce**			

-They make observations of animals and plants and explain why some things occur, and talk about changes. -Children know about similarities and differences in relation to places, objects, materials and living things.	Plants include trees (deciduous and evergreen), flowers (wild and cultivated) and hedges and bushes. -Most plants usually grow from seeds and bulbs. -Plants need warmth, light and water to grow and survive	-A seed produces roots to allow water to get into the plant and shoots to produce leaves to collects the sunlight. -All flowering plants make seeds that can grow into new plants -Sometimes the plant dies after it has produced its seed and sometimes the plant lives for many generations producing seeds each year.	-Plants make their own food in their leaves to provide them with energy, grow, repair, and reproduce. -Leaves absorb sunlight and carbon dioxide through leaves. -Plants have roots to provide support and to draw moisture from the soil, through stems to take water to the rest of the plant. -The plant makes its food from water and carbon dioxide, using sunlight as energy, in the green parts of plants (mainly leaves) -Flowering plants have evolved specific parts to carry out pollination, fertilisation and seed growth. -Seed dispersal improves chances of enough seeds germinating and growing to mature plants and reproducing. -Seeds and bulbs need the right conditions to germinate. They contain a food store for the first stages of growth (i.e. until the plant is able to produce its own food)			

	Longitudinal Study -By growing wildflowers, observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.		**Longitudinal Study** -Observe the lifecycles of plants and how these are associated with the seasonal changes.			
Related National Curriculum Objectives in italics:	*-identify and name a variety of common wild and garden plants, including deciduous and evergreen trees* *-identify and describe the basic structure of a variety of common flowering plants, including trees* *-observe changes across the 4 seasons* *-observe and describe weather associated with the seasons and how day length varies*	*-observe and describe how seeds and bulbs grow into mature plants* *-find out and describe how plants need water, light and a suitable temperature to grow and stay healthy*	*-identify and describe the functions of different parts of 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*			

Animals including Humans

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	How Animals Survive	**Animal Lifecycles**	**Skeletons and Movement**	**Digestion**	**Growth**	**Circulation; how nutrients get to where they are needed in the body**
-They make observations of animals and plants and explain why some things	-There are many different animals with different characteristics -Animals need food to survive (**carnivores,**	-All animals eventually die. -Animals reproduce new animals when they reach maturity. -Animals grow until they reach maturity	-Many animals have skeletons to support their bodies and protect vital organs. -Muscles are connected to bones	-Animals need a variety of foods to help them grow and survive. -Different animals are adapted to eat different foods. Humans require a balanced diet to remain	-Humans development is in stages (baby, child, teenager, adult, old age). -During puberty humans experience changes.	-Oxygen is breathed into the lungs where it is absorbed by the blood. -The heart pumps blood around the body. -Muscles need oxygen to release the energy from

occur, and talk about changes. -Children know about similarities and differences in relation to places, objects, materials and living things.	**omnivores and herbivores).** -Animals need a variety of food to help them grow, repair their bodies, be active and stay healthy. -Animals move in order to survive. -Exercise keeps animal's bodies in good condition and increases survival chances. -Animals have senses to help individuals survive. When animals sense things they are able to respond	and then don't grow any larger. -Life cycles vary between different animals	and move them when they contract. -Movable joints connect bones	healthy but healthy diets vary depending upon the type of activity that humans do. -Animals have teeth to help them eat. Different types of teeth do different jobs. -Food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood. The blood takes nutrients around the body. -Nutrients produced by plants move to primary consumers then to secondary consumers through food chains.	-Gestation periods are different for different animals.	food to do work: Oxygen is taken into the blood in the lungs, the heart pumps blood through blood vessels to the muscles, the muscles take the oxygen and nutrients from the blood
Related National Curriculum Objectives in italics:	*-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*	*-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*	*-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*	*-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*

	-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*	*different types of food, and hygiene*	*support, protection and movement*			*within animals, including humans*

Evolution and Inheritance

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						Evolution and Natural Selection
-Talk about the features of their own immediate environment and how environments might vary from one another.				-		-Fossils provide evidence that Living things have changed over time. -Environmental change can affect how well an organism is suited to its environment. -Over time the characteristics that are most suited to the environment become increasingly common. -Some organisms reproduce sexually where offspring inherit information from both parents. -Some organisms reproduce asexually by making a copy of a single parent -Different types of organism have different life cycles.

						-Life cycles have evolved to help organisms survive to adulthood.
Related National Curriculum Objectives in italics:						*-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*

Materials						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Why Do We Choose Materials to Do Certain Jobs?		**Rocks & Soils**	**Solids, Liquids & Gases** **Mixtures & Separation**	**Making New Substances**	
-Children know about similarities and differences in relation to places, objects, materials and living things.	-There are different materials -Materials have describable properties -Different materials have different properties. -Materials can be changed by physical force (twisting, bending, squashing and stretching) **A variety of materials explored throughout LKS1 through different topics. All classes of materials will be covered across the two year groups.**		-There are different kinds of rocks. -Different rocks have different physical properties and appearance -Soil is formed from rocks and organic matter. -Fossils form of evidence about	-Materials can be divided into solids, liquids and gases. -Solids, liquids and gases are described by observable properties -Heating causes solids to melt into liquids and liquids to evaporate to gases -Cooling causes gases to condense to	-All matter (including gases) has mass. -Heating can sometimes cause materials to change permanently. When this happens, a new substance is made. These changes are not reversible. -Sometimes mixed substances react to make a new substance. These	

			creatures from the past. -Fossils are formed when things that have lived are trapped within rock.	liquids and liquids to freeze to solids -The temperatures at which given substances change state are always the same. -Materials change state by heating and cooling. -Some changes can be reversed and some can't. -When two or more substances are mixed and remain present the mixture can be separated.	changes are usually irreversible.	
Related National Curriculum Objectives in italics:	-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	*-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*	*-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*	

	simple physical properties			*associate the rate of evaporation with temperature*	*substance from a solution* *-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*	

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Living Things and their Habitats					
Year 1	**Year 2**	**Year 3**	**Year 4** **Feeding Relationships and the Environment**	**Year 5**	**Year 6**
	-All animals get their nutrients by eating. Some animals hunt and eat other animals (***predators***) and some animals are hunted and eaten by other animals (***prey***). -There is variation between all living things. -Different animals and plants live in different places. -All animals are adapted to eat and survive (they are adapted to survive as predators ***and*** prey). -Plants are also adapted to survive; they have adapted to get the water and light they need and avoid being eaten or dying when chewed. - Living things are adapted to survive in different habitats. -The changing seasons have a dramatic effect on plants, which has an impact on the animals that feed on them. Animals have adapted ways of surviving when the seasons change and food become scarce including hibernating, storing food (fattening up), migrating.		-Living things can be divided into groups based upon their characteristics. -Different food chains occur in different habitats. -Environmental change affects different habitats differently. -Human activity significantly affects the environment. -Different organisms are affected differently by environmental change	-Different animal groups have life cycles. -Changes are observed in an animal over a period of time. -Different animal groups reproduce and grow in different ways. -Plants and animals reproduce: sexual reproduction in animals, sexual and asexual reproduction in plants. -Explore the work of well known naturalist (David Attenborough and Jane Goodall).	-Living things are broadly grouped (micro organisms, plants and animlas). -Broad groups can be sub divided into vertebrates (reptiles, fish, amphibians, birds and mammals) and invertebrates (insects, molluscs, annelids, arachnids). - Carl Linnaeus created a classification system. -Living things placed in classification system according to physical characteristics.
-	**Longitudinal Study** Identification of creatures and plants in the local environment and how		**Longitudinal Study** The identification and classification of	-	

	their populations change through the seasons. Linking the properties of the seasons to the changing populations and beginning to question how populations of different organisms are related.		creatures and plants in their local environment (insects, spiders, birds, mammals, reptiles and amphibians). Questions should require children to consider how environmental change (the seasons, human activity, climate change) affects different organisms within their environment differently and therefore different habitats differently because all organisms in a habitat are interdependent.		
	-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*		*-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*	*-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*

	-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		*dangers to living things*		