Primary School - Science Curriculum Progression

		Year 1	Year 2
Plants		**National Curriculum.** Pupils should be taught to: • 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.	**National Curriculum.** Pupils should be taught to: • 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.
	Key Ideas	• Plants usually grow from seeds and bulbs. • Plants need warmth, light and water to grow and survive • Most plants start growing from a seed or bulb. • All plants need water, light and warmth to grow and survive. Seeds produce roots to allow water to get into the plant and shoots to produce leaves to collect the sunlight.	Flowering plants make seeds to reproduce and make more plants. Some plants die after producing seeds and others live for many generations. All flowering plants make seeds that can grow into new plants Sometimes the plant dies after it has produced its seed Sometimes the plant lives for many generations producing seeds each year
Animals		**National Curriculum.** Pupils should be taught to: • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	**National Curriculum.** Pupils should be taught to: **Animals, including humans** • notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **Living things and their Habitats** • 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 micro-habitats • 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
	Key Ideas	• There are many different animals with different characteristics • Animals need food to survive • 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 Animals need food to survive; it gives them energy to move and material to grow. Animals are all different and so eat different foods, some eat other animals (carnivores) and others only eat vegetables (herbivores). Animals have to get their food so they have to move to where it is, which means they have to move in different ways depending upon where their food is. Animals that eat other animals have to hunt them (predators) animals that are hunted are prey.	**Simple Animal timelines** • All animals eventually die. • Animals reproduce new animals when they reach maturity. • Animals grow until they reach maturity and then don't grow any larger • Different animals live for different ages • Different animals reach different sizes before they are able to reproduce • Different animals reproduce at different ages **Habitats** • Some things are living, some were once living but now dead and some things have never lived • There is variation between all living things. • Different animals and plants live in different places. • Living things are adapted to survive in different habitats. • Environmental change can affect the plants and animals that live there 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***). • Animals that eat only other animals are called ***carnivores.*** Animals that only eat plants are called ***herbivores***, and animals that eat both animals and plants are called ***omnivores***

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		Animals use their senses to detect where their food is and if there are any predators around, animals have different ways of avoiding being eaten e.g. camouflage, protection and moving away fast.	All animals are adapted to eat and survive (they are adapted to survive as predators ***and*** prey). Animals have adapted many different ways to survive as predators or 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. 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. **Longitudinal studies** • Children should raise and explore questions that ***demand*** the identification of creatures and plants in their local environment and how 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.
Materials		**National Curriculum** Pupils should be taught to: **Everyday Materials** • distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties.	**National Curriculum** Pupils should be taught to: **Uses of Materials** • 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.
	Key Ideas	• 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) • There are many different materials that have different describable and measureable properties. • Materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and ceramics (including glass). • The properties of a material determine whether they are suitable for a purpose. These ideas are explored through testing materials to see if they are appropriate for particular jobs. Topics need to be arranged so that all the main groups of materials are explored and important properties are investigated (strength, flexibility, waterproofness, absorbency, softness, slippiness, stretchiness, brittleness)	• 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) • There are many different materials that have different describable and measureable properties. • Materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and ceramics (including glass). • The properties of a material determine whether they are suitable for a purpose. These ideas are explored through testing materials to see if they are appropriate for particular jobs. Topics need to be arranged so that all the main groups of materials are explored and important properties are investigated (strength, flexibility, waterproofness, absorbency, softness, slippiness, stretchiness, brittleness)
Seasons		**National Curriculum** Pupils should be taught to: • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies.	
Working Scientifically		**National Curriculum** • 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	

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	Year 3	Year 4	Year 5	Year 6
Plants	**National Curriculum.** Pupils should be taught to: • 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.			
	• 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) • 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)			
Animals, including Humans	**National Curriculum.** Pupils should be taught to: • identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other animals have skeletons and muscles for support, protection and movement.	**National Curriculum.** Pupils should be taught to: • 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.	**National Curriculum.** Pupils should be taught to: • describe the changes as humans develop to old age. **Living Things & their Habitats** • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	**National Curriculum.** Pupils should be taught to: • 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

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		Living Things & their Habitats • recognise that living things can be grouped in a variety of ways • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • recognise that environments can change and that this can sometimes pose dangers to living things.	• describe the life process of reproduction in some plants and animals.	• describe the ways in which nutrients and water are transported within animals, including humans. **Living Things & their Habitats** • 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.
	Skeletons & movement: All vertebrates have internal skeletons that protect vital organs. Invertebrates have exoskeletons that protect vital organs Skeletons support the weight of land animals. Stronger bones can support more weight Bones are connected (but can move relative to each other) at joints. Muscles connect to bones and move them when they contract. Stronger bones can anchor stronger muscles	**Digestion:** Animals need a variety of foods to help them grow and survive. The main food groups are: • Meat, dairy and pulses to provide protein for muscles. • Grains and root vegetables to provide carbohydrates for energy. • Fat for insulation and energy. • Fruit and vegetables for minerals, vitamins and fibre. These are essential to keep our bodies working well and protect us from illnesses. Different animals require different foods to survive. Humans require a balanced diet to remain healthy but healthy diets vary depending upon the type of activity that humans do. The nutrients in food have to get to every part of the body. The blood transports them. The role of digestion is to get the nutrients in food to dissolve in the blood, if it doesn't dissolve it can enter the blood and be transported.		**Respiration in animals** All animals need oxygen to survive. Air is breathed into the lungs where the oxygen in the air is passed into the blood. Every part of animals bodies need oxygen, especially muscles Muscles need a supply of oxygen and sugar to make them work, they are supplied this by the blood. **The blood circulation model**

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Forces & magnets	**National Curriculum.** Pupils should be taught to: • compare how things move on different surfaces • notice that some forces need contact between two 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 two poles • predict whether two magnets will attract or repel each other, depending on which poles are facing.		**National Curriculum.** Pupils should be taught to: • 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.	
	• 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 Magnets exert attractive forces on some metals Each end of a magnet is called a pole, opposite poles are called north and south. Magnets exert attractive forces on each other when the poles facing each other are north and south (opposites). Magnets exert repulsive forces on each other when the poles facing each other are the same. Magnetic forces work through other materials including air, so magnets don't need to be touching to exert their force. It is called a non-contact force The strength of magnetic forces are affected by: • The strength of the magnet. • The distance between the magnet and the object. • The material the object is made from.		**Forces that Oppose Motion** • Air resistance and water resistance are forces against motion caused by objects having to move air and water out of the way. • All matter (including gases) has mass. • 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.	

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Materials		**National Curriculum** • compare and group materials together, according to whether they are solids, liquids or gases • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	**National Curriculum** • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • 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.	
		Solids, Liquids & Gases • 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 liquids and liquids to freeze to solids **Mixtures and separating them** • 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.	**Making New Substances** • 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 changes are usually irreversible. **The big idea** It is possible to change materials into completely different ones. This is very important because new substances might have different properties to materials we currently have. For example plastics can be moulded into intricate shapes, are waterproof, strong and electrical insulators. When materials are heated or mixed with other materials they sometimes can be made to turn into new materials. The question is how would we know if it was a new material or the same material mixed differently? Indicators that something new has been made are: • The properties of the material are different (colour, state, texture, hardness, smell, temperature) • If it is not possible to get the material back easily it is likely that it is not there any more and something new has been made (irreversible change)	•

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Sound		**National Curriculum.** Pupils should be taught to: • 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.		
		• 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.		
Electricity		**National Curriculum** Pupils should be taught to: • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors.		**National Curriculum.** Pupils should be taught to: • 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.

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		• 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. • 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 Lots of devices are powered by electricity; these need a source of electricity which could be mains or battery. The battery's job is to push electricity to the device, but it needs something to carry the electricity all the way from the supply to the device, this is what we call a circuit. If there are more batteries they push harder and so the device will work harder e.g. brighter or faster.		• 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. • When current flows through wires heat is released. The greater the current the more heat is released
Earth & Space			**National Curriculum** • 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.	
			• 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	•

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Rocks	**National Curriculum** • 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			
Evolution				**National Curriculum** • 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.
				• Some organisms reproduce sexually where offspring inherit information from both parents. Some organisms reproduce asexually by making a copy of a single parent • 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 • Different types of organism have different life cycles. • Life cycles have evolved to help organisms survive to adulthood.

	Year 3	Year 4	Year 5	Year 6

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Scientific Enquiry	• asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.	• planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments.
	Expectations by age 9:	**Expectations by age 11:**