Alverton Knowledge and Skills – **Science**

Key Knowledge and Skills
Develop children's understanding of science through different types of scientific enquiry that help them to answer questions about the world around them.
Develop scientific knowledge and conceptual understanding.

	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Working Scientifically **(to be delivered through teaching of subject content and not taught separately).**	Ask simple scientific questions and recognise that there are different ways to answer them.	Ask relevant questions and use evidence to answer these.	Plan scientific enquiries to answer questions; use scientific evidence to answer these and support findings.
	Perform simple tests.	Set up practical enquiries and fair tests using a range of scientific equipment.	Set up practical enquiries and tests including controlling variables.
	Observe closely using simple equipment and collect data.	Make careful observations and begin to make accurate measurements.	Make systematic observations and take accurate measurements using a range of scientific equipment.
	Record findings eg as drawings, diagrams, photographs or in simple prepared format such as tables and charts.	Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.	Record and present data and results in a range of ways – eg scientific diagrams / labels, classification keys, tables, charts and graphs.
		Report findings from investigations including oral and written explanations or presentations of results and conclusions.	Report findings from investigations: written explanations including causal relationships and conclusions.
	Use observations and ideas to answer questions.	Use results to draw simple conclusions and suggest improvements and predictions for setting up further tests.	Continue to develop the ability to use test results to make predictions, set up further comparative / fair tests and draw conclusions.
	Identify and classify.		
			Identify scientific evidence that has been used to support or refute ideas or arguments.

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Plants	Y1 Identify and name common plants. Identify and describe the basic structure of a variety of a flowering plant. Y2 Describe how seeds and bulbs grow. Describe how plants need water, light and a suitable temperature to grow.	Y3 Identify and describe the functions of different parts of flowering plants. Identify requirements of plants for life and growth 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.	
Living Things and their Habitats	Y2 Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify living things live in habitats to which they are suited and how these provide basic needs of animals and plants. Identify and name a variety of plants and animals in their habitats. Describe how animals obtain their food from plants and other animals, using a simple food chain.	Y4 Recognise that living things can be grouped in a variety of ways and give reasons for classifying plants and animals. Use classification keys to help group, identify and name a variety of living things. Explain using food chains / webs how feeding relationships occur in a habitat. Identify producers, predators, prey, herbivores, carnivores, omnivores. Recognise that environments can change and that this can sometimes pose dangers to living things.	Y5 Describe the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. Y6 Describe how living things are classified into broad groups according to characteristics and based on similarities and differences. Give reasons for classifying plants and animals based on specific characteristics.
Animals, including Humans	Y1 Identify and name a variety of animals including fish, amphibians, reptiles, birds and mammals. Identify carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals. Identify, name, draw and label the basic parts of the human body and relate to senses. Y2 Explain that animals, including humans, have offspring which grow into adults. Describe the basic needs of animals, including humans, for survival.	Y3 Explain 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 animals have skeletons and muscles for support, protection and movement. Y4 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.	Y5 Describe the changes as humans develop to old age. Y6 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 bodies function. Describe the ways in which nutrients and water are transported within animals, including humans.

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	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.		
Evolution and Inheritance			Y6 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	Y1 Everyday Materials Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials. Describe the simple properties of a variety of everyday materials. Compare and group together materials based on their properties. Y2 Uses of Materials Identify and compare the suitability of a variety of everyday materials for particular uses. Find out how the shapes of solid objects can be changed by squashing, bending, twisting and stretching.	Y3 Rocks Compare and group rocks on their appearance / physical properties. Describe how fossils are formed. Recognise that soils are made from rocks and organic matter. Y4 States of Matter Compare and group materials into solids, liquids and gases. Explain that some materials change state when they are heated or cooled, and measure the temperature in degrees Celsius (°C). Give reasons for changes to the state of water using the correct vocabulary, Identify evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Y5 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. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials. 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. Demonstrate reversible changes. Explain that some changes result in the formation of new materials, and that this kind of change is difficult to reverse.
Light and Sound		Y3 Light 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.	Y6 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.

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		Recognise that shadows are formed when the light from a light source is blocked by a solid object. Find patterns in the way that the size of shadows change. Y4 Sound Identify how sounds are made, associating some of them with something vibrating. Explain how sounds are heard (vibrations travel through various materials 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.	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Find patterns in the way that the size of shadows change (link to sunlight). Explain that light can be broken into colours.
Forces and Magnetism		Y3 Magnets Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Compare and group together materials based on whether they are attracted to a magnet. Investigate how magnets attract some materials and not others and identify some magnetic materials. Observe how magnets attract or repel each other and predict whether magnets will attract or repel each other, depending on which poles are facing.	Y5 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. Measure the size of a force. Explain that forces push / pull objects making them change shape. Explain the idea of speed.
Electricity		Y4 Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts. 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 (as above). Recognise some common conductors and insulators, and investigate these.	Y6 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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Space			Y5 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. Understand how the four seasons are linked to the movement of the Earth.
Seasons	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.		