Science Long Term Plan KS1 & KS2

KS1 Working scientifically objectives		• 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.			**Scientists Studied**	• Charles Macintosh • Martin Brock • Wangari Maathai • John Loudon McAdam • Julie Brusaw • Dr Ernest Madu • David Douglas	
		Term 1	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Year Group	**Knowledge Organiser**	**Animals Including Humans**		**Materials**	**STEM** **Seasonal Changes**	**Plants**	
	Seasonal Changes NC POS- Year 1 & 2	**Autumn**	**Winter**		**Spring**	**Summer**	
		• Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies.					
1	**Enquiry Question and Unit Aim**	*How do scientists classify animals?* Children can group animals scientifically and children know the basic parts of a human body and their functions.		*How does grouping materials help us understand what they are made from?* Children can group materials according to their properties.	*How is STEM used in our world?* Children can design, make and evaluate. Children can link STEM projects to real life scenarios.	*What happens during the life cycle of flowering plants and trees?* Children know the parts of a flowering plant and can explain changes that happen to them over time.	
	National Curriculum Programme of Study	identify and name a variety of common animals including fish, amphibians,	Identify, name, draw and label the basic parts of the human body and say which	Distinguish between an object and the material from which it is made.	Understand that air resistance is a type of friction and know that the size or	Identify and name a variety of common wild and garden plants, including	Identify and describe the basic structure of a variety of common

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		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).	part of the body is associated with each sense.	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.	shape of an object affects its air resistance (parachutes). Observe and describe weather associated with the season Spring. Identify the best material for a purpose - Curtain experiment. Discover the strength of the triangle in construction and know how to use it to build a strong structure (Port Lympne bear enclosure). Explore the impact humans have on the environment (bird feeders). Make observations and simple measurements in a familiar context -	deciduous and evergreen trees	flowering plants, including trees.

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					Sandcastle experiment.		
2	**Knowledge Organiser**	**Materials**		**Animals Including Humans**		**Living Things and their Habitats**	**Plants**
	Enquiry Question and Unit Aim	*How do people decide which materials to use for different purposes?* Children can identify and compare materials.		*How do the basic needs of animals including humans change as they grow from offspring to adults?* Children will be able to explain how the basic needs of animals (including humans) change as they grow from babies to grown-ups. Include: basic needs for survival, food, water shelter.		*Explain how animals are suited to their habitats.* Children can classify animals, identify their habitats and basic needs.	*What do plants need to survive and grow?* Children can explain the process of plant growth and identify the main parts of a plant.
	National Curriculum Programme of Study	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.	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.	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	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.

						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. 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.	

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KS2 Working scientifically objectives		• 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.			**Scientists Studied**	• William Gilbert • Mary Somerville • Alessandro Volta • Wilhelm Conrad Rontgen • Michael Faraday • Mary Anning • Justus von Liebig • Joseph Dalton Hooker • Christian Doppler • Thomas Edison • Bernard Palissy • Jane Goodall • William Beaumont • Spencer Silver • David Attenborough • Lucy Evelyn Cheesman • Sarah Fowler • Nicolaus Copernicus • Maggie Aderin-Pocock • Galileo Galilei • Sir Isaac Newton • Nicholas Tesla • William Harvey • Carl Linnaeus • Charles Darwin • Abu Ali al-Hasan (Alhazen)	
		Term 1	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Year group	**Knowledge organiser**	**Animals Including Humans**	**Forces and Magnets**	**Rocks**	**Light**	**Plants**	
3	**Enquiry Question and Unit Aim**	*How do our skeletons and muscles work together to help us move?*	*Why are some materials magnetic and others not?*	*Describe the 3 processes of rock formation.* Children can describe rock formation.	*Why do shadows form? Explain why using scientific vocabulary.*	*Describe the different parts of a plant and explain what they need to grow.* Children can identify different parts of plants.	

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		Children can describe how our skeletons provide a strong framework for our bodies, while our muscles give us the power to move.	Children can explain what makes a material magnetic.		Children explain how and why shadows form.		
	National Curriculum Programme of Study	Identify that humans and some other animals have skeletons and muscles for support, protection and movement. 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.	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	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.	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	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.

			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.		way that the size of shadows change.		
4	**Knowledge Organiser**	**Sound**	**Electricity**	**States of Matter**	**Living Things and their Habitats**		**Animals Including Humans**
	Enquiry Question and Unit Aim	*Explain what sound is, how it travels and how we hear.* Children know what sound is, how it travels and how we hear.	*Describe how an electrical circuit works and explain what conductors and insulators are.* Children can build basic circuits, identify its parts and conductors and insulators.	*What are the 3 states of matter and how can they change?* Children know the 3 states of matter and how they can change.	*Explain how our environment is changing and what effect this will have on living things.* Children can explain how living things survive in relation to their place in food chains and identify habitats and how they are changing.		*Explain how the digestive system works.* Children will be able to explain the journey food takes by demonstrating their understanding of the digestive system.
	National Curriculum Programme	Identify how sounds are made, associating some of	Identify common appliances that run on electricity.	Compare and group materials together, according to whether	recognise that living things can be grouped in a variety	Recognise that environments can change and that this	Describe the simple functions of the basic

	of Study	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.	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	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.	of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	can sometimes pose dangers to living things.	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.

			conductors.				

5	**Knowledge Organiser**	**Properties and Changes of Material**		**Living Things and their Habitats**	**Earth and Space**	**Forces**	**Animals Including Humans**
	Enquiry Question and Unit Aim	*Explain how the properties of a material make it suitable for its intended use.* Children can describe the properties of materials.	*Explain how dissolving, mixing and changes of state are reversible changes.* Children can explain how dissolving, mixing and changes of state are reversible changes.	*Explain how flowering plants reproduce.* Children can describe how flowering plants reproduce.	*Explain the movements of the Earth, moon and other planets in our Solar System.* Children can explain the movements of the moon, and the planets relative to other bodies in the Solar System.	*Describe the force of gravity, air resistance and friction.* Children can describe different forces.	*Explain what happens to boys and girls during puberty.* Children can describe how our bodies change due to puberty and other factors.
	National Curriculum Programme of Study and Unit Aims	Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency,	Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life	Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Describe the	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	Describe the changes as humans develop to old age.

		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, including metals, wood and plastic.	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. 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.	process of reproduction in some plants and animals.	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.	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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6	Knowledge Organiser	Electricity	Animals Including Humans	Living Things and their Habitats	Evolution and Inheritance	Light	
	Enquiry Question an Aim	*Describe components and their functions in a circuit.* Children can build a more complex circuit, identifying its parts and their functions.	*What are the different parts of the circulatory system? Describe each of their functions.* Children can identify parts of the circulatory system and their functions.	*How are living things classified into groups based on their characteristics?* Children can explain how living things are grouped based on their characteristics.	*Why do living things adapt? Explain the process of evolution.* Children can describe adaptations and the process of evolution.	*Why is light able to pass through certain objects but not others?* Children can explain how light passes/is blocked by certain objects and why.	*How does light travel and how do we see objects?* Children know how light travels and why we can see objects.
	National Curriculum Programme of Study	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.	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 within animals,	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. Give reasons for classifying plants and animals based on specific characteristics.	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	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. Use the idea that light travels in straight lines to explain why shadows have the same shape as the	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 recognised symbols when representing a simple circuit in a diagram.	including humans.		and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	objects that cast them.	