

St Teresa's Catholic Primary School

Knowledge Progression Map

Science						
Substantive knowledge						
Disciplinary knowledge						
St Teresa's Cultural Capital opportunities In science						
Biology	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Living Things and Habitats		<p>Explore and compare the differences between things that are living, dead, and things that have never been alive</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>Identify and name a variety of plants and animals in their habitats, including microhabitats</p> <p>Describe how animals obtain their food from plants and other</p>	<p><u>Bees</u></p> <p>Understand ways that bees (and other insects) can be helpful, such as: pollination; products like honey, beeswax, and silk; and eating harmful insects.</p> <p>Distinguish key characteristics such as: the exoskeleton, the chitin, the six legs and three body parts: head, thorax and abdomen; and wings</p> <p>Understand the life cycles bees.</p> <p>Understand the behaviour of certain bees.</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>Recognise that environments can change and that this can sometimes pose dangers to living things</p> <p>Become familiar with and recognise basic characteristics of: fish, amphibians, reptiles, birds and mammals</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p> <p>Understand the growth stages of a human: embryo, foetus, new-born, infancy, childhood, adolescence, adulthood, old age</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>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>Understand development of an embryo - egg, zygote, embryo, growth in uterus, foetus, new-born (build on Year 5)</p> <p>Understand external fertilisation of some</p>

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		<p>animals, using the idea of a simple food chain, and identify and name different sources of food.</p>		<p>Understand how ecosystems can be affected by changes in environment (for example, rainfall, food supply, etc.) and by man-made changes Understand man-made effects of the environment</p>		<p>animals Understand internal fertilisation of some animals (e.g. birds and mammals) Understand basic taxonomy Understand different classes of vertebrates and major characteristics (review of Y4) Understand basic cell structure Understand the differences between animal & plant cells</p>
<p>Plants</p>	<p>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 four seasons. Observe and describe weather associated with the</p>	<p>Observe and describe how seeds and bulbs grow into mature plants. (Plants) Describe how plants need water, light and a suitable temperature to grow and stay healthy, and describe the impact of changing these. (Plants)</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Plants) Explore and describe 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. (Plants)</p>			

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	<p>seasons and how day length varies.</p>		<p>Investigate the way in which water is transported within plants. (Plants) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Plants)</p>			
<p>Animals, including Humans</p>	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Group animals according to what they eat. 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,</p>	<p>Understand that animals, including humans, have offspring which grow into adults. 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.</p> <p>Understand that offspring are very</p>	<p>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.</p> <p>Understand that germs can cause diseases and how to</p>	<p>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.</p> <p>Describe the functions and parts of the excretion system in humans Understand how to take care of your body with a healthy</p>	<p>Describe the changes as humans develop to old age</p>	<p>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, including humans.</p> <p>Understand the basic workings of the respiratory system</p>

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	reptiles, birds and mammals, including pets). Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.	much (but not exactly) like their parents Understand that most animal babies need to be fed and cared for by their parents, especially human babies Recognise that pets have special needs and must be cared for	prevent illness, by taking care of your body and having vaccinations	diet, including the 'food pyramid', vitamins and minerals (build on Year 3)		
Seasonal Changes	observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies <i>Seasonal changes objectives will be red- working towards until the children have experienced this within all 4 seasons.)</i>					
Evolution and inheritance						Recognise that living things have changed over time and that fossils provide info

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						about living things that inhabited Earth millions of years ago Recognise that living things produce offspring of the same kind but they vary and aren't identical to parents Identify how animals and plants are adapted to suit their environment in different ways and that this leads to evolution.(building on Animals, including humans Year 1,2,3,4,5)
Physics	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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			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

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			<p>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.</p>			<p>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.</p>
<p>Sound</p>				<p>Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear, and that sound waves are slower than light waves Find patterns between the pitch of sounds and features of the object/speed of vibration Find patterns between the volume of a</p>		

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				<p>sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as distance from source increases</p>		
Forces (and magnets)			<p>Compare how things move on different surfaces Notice that some forces need contact between two objects, but magnetic forces act at a distance Observe how magnets attract or repel each other and attract some materials and not others Group everyday materials on the basis of whether they are attracted to a magnet, and identify magnetic materials (revision) Describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending</p>		<p>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, gears, inclined planes, wedges and screws allow a smaller force to have a greater effect.</p>	

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			<p>on which poles are facing</p> <p>Discuss our magnetic field Understand that the Earth behaves like a huge magnet</p> <p>Understand basic use of a magnetised needle in a compass, which always pointing north</p>		<p>Understand how a gear works and some of its common uses</p>	
Electricity				<p>Identify common appliances that run on electricity Make simple series circuit - cells, wires, bulbs, switches and buzzers</p> <p>Identify if a lamp will light in a simple circuit, based on being part of a complete loop with a battery Recognise that a switch opens/closes a circuit and associate this with whether or not a lamp lights in a series circuit</p> <p>Recognise</p>		<p>Associate the brightness of a lamp or volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>Compare/give reasons for variations in how components function, including brightness of bulbs, loudness of buzzers and on/off position of switches</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p>

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				conductors & insulators		Understand short circuits Understand electric current
Earth and space					<p>Thematic Learning (spring topic)</p> <p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>Describe the movement of the Moon relative to the Earth and</p> <p>understand the moon's phases</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p>Understand how seasons are caused by Earth's orbit and rotation</p>	

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Chemistry	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Rocks			<p>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 (build on Year 1 and 2 materials)</p>			
States of matter				<p>Compare and group materials together according to whether they are solids, liquids or gases Observe that some materials change state when heated or cooled, and measure or research the temperature at which this happens in degrees Celsius</p>	<p>Name the Earth's layers: crust, mantle, core (outer core and inner core) Understand movement of tectonic plates (earthquakes, Tsunamis and volcanoes) Understand basic volcanology: active, dormant, extinct</p>	

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				Identify the part played by evaporation and condensation in the water cycle: associate the rate of evaporation with temperature (build on Year 1,2 materials and year 3 rocks)	volcanoes Understand basic theories of how the continents & oceans were formed, mountain/rock formation Understand the effects of weathering	
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	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Compare how things move on different surfaces. 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 everyday materials on the basis of their properties Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution (solute/solvent) Use knowledge of solids, liquids and gases to decide how mixtures might be separated Give reasons for the particular uses of everyday materials, including metals, wood and plastic Demonstrate that	

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					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.	
Working Scientifically	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<p>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> 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 		<p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> 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 		<p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> 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 	

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				<ul style="list-style-type: none"> 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. 		<ul style="list-style-type: none"> 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 	
EYFS	Animals, including humans	Materials	Earth and space Including seasons	Plants	Living things and their habitats	Forces and magnets	Light and sound
Children will know of the world around them children at the expected level will.	Children will begin to know the importance of keeping healthy as well as ways to keep healthy such as handwashing. Children will make observations through their	Children will begin to explore the world around them and make observations of animals. -Know some similarities and differences of the world around them and what they have been	Children will begin to understand hot/cold weather and match clothing/objects that relate to these. Children will begin to explore the seasons and look	Children will begin to understand the natural world and observe different plants in their local environment. Children will begin to have a go at drawing a	Children will begin to know the need to respect and care for the natural environment and all living things. Children will begin to that different plants and animals	Pupils may use magnets as a way to explore and learn about different materials. Children will begin to explore how some materials are	Children will begin to know about the natural world to make shadows by blocking light sources. Children will begin to use their understanding of light and relate

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	growing and changing unit. Children will compare ways in which they have changed and how animals change.	read in class. - Make sure of outdoor areas as a way to explore different materials. For example, bridge building using foam blocks, lego etc. and den building.	at the weather around them and in different parts of the world. Children will begin to understand the effect of changing seasons on the natural world around them. Children will enhance their learning and understanding of earth and space through role play and outdoor exploration.	plant from observation. Children will have the opportunity to gain a foundation understanding of plants through planting and observing plants growing in their garden across the year.	grow in different parts of the world. -Learn that some animals metamorphose from young to their adult form e.g. caterpillar turns into a butterfly. Learning in their area may be extended through role play such as a hungry caterpillar lunch, which would also be focusing on healthy eating.	attracted to magnets.	this to the different seasons.
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