SACRED HEART CATHOLIC PRIMARY SCHOOL & NURSERY

Science Progression Map

Progression Aims	This document aims to show the progression in knowledge and skills that are essential in building pupils' inquisitive skills in order to question the world around them and then to find answers. Pupils will question what they know and be supported in developing fair testing in order to observe, collate results and analyse data on their findings. Pupils will have the opportunity to revisit knowledge from previous years as this is woven into the curriculum for each year group and they will be able to invest in practical experiments that will be progressive and more open ended, to provide opportunities for pupils to make informed, real-world decisions on what would work best. This document also shows the progression of required vocabulary that the children should understand throughout each topic as a prerequisite for further learning. Vocabulary is not exclusive to each year group, however there a specific focus on the language in the topics covered in that science unit. We value a vocabulary rich curriculum and we provide opportunities for the pupils to verbalise their knowledge using subject specific vocabulary to demonstrate their understanding.

Science	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	Show curiosity about objects, events and people Question why things happen Take a risk, engage in new experiences. Develop ideas of grouping, sequences, cause and effect. Find ways to solve problems, new ways to do things. Comment and ask questions about familiar world. Choose and use resources. Answer how and why questions. Connect ideas and events		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 Asking simple questions and recognising that they can be answered in different ways Observing closely, using simple equipment Performing simple tests Identifying and classifying		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: 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		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: 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,	

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	Develop own narratives and explanations.		Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions		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.		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 presentation Identifying scientific evidence that has been used to support or refute ideas or arguments	
	plant leaf branch	bulb weed shoot	deciduous evergreen tree	light suitable temperature	air nutrients soil			

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Biology - Plants	flower petal seed berry fruit vegetable water grow	root stem bark soil	trunk branches, oak holly willow birch chestnut conker daisy buttercup rose daffodil	grow healthy germinate decompose	reproduction transportation dispersal pollination flower			
	Plant seeds and care for growing plants	Explore the natural world around them, making observations and drawing pictures of animals and plants	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 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			

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					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.			
	head eyes nose mouth ears hands fingers feet toes arm leg animal	herbivore face carnivore hair omnivore leg human knee animal arm fish elbow birds back head toes	fish reptiles mammals birds, amphibians herbivore omnivore carnivore leg arm elbow head ear nose back wings	Survival Water Air Food Adult Baby Toddler Teenager Offspring Kitten Calf Puppy Exercise Hygiene Young, offspring	Movement Muscles Bones Skull Nutrition Skeletons skeleton, muscles, tendons, joints, protection, support, organs, voluntary muscles, involuntary	Mouth Tongue Teeth Oesophagus Stomach Small Intestine Large Intestine Herbivore Carnivore Canine Incisor Molar digestion, molar, premolar, incisor, canine,	Foetus Embryo Womb Gestation Baby Elderly Growth Development Puberty	Circulatory Heart Blood Vessels Veins Arteries Oxygenated Deoxygenated Valve Exercise Respiration Pulse Capillaries Platelets Blood cells Drugs Alcohol

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Biology – Animals including Humans		ear hands eye fingers mouth nose	beak sight, hearing, touch, smell, taste.	live young grow develop change hatch lay fly crawl talk. basic needs survive food air exercise diet nutrition healthy balanced diet hygiene germs proteins dairy and alternatives carbohydrates oil and spreads fat salt sugar	muscles, biceps, triceps contract relax bone cartilage shell vertebrate invertebrate	wisdom teeth, tooth decay, plaque, enamel		Disease Nutrient transportation
	Understand the key features of the life cycle of a plant and an animal	Name and describe people who are familiar to them	Identify and name a variety of common animals including fish, amphibians,	Notice that animals, including humans, have offspring which grow into adults	Identify that animals, including humans, need the right types and amount of	Describe the simple functions of the basic parts of the digestive system in humans	Describe the changes as humans develop to old age.	Identify and name the main parts of the human circulatory system, and

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		Describe what they see, hear and feel whilst outside	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	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	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.	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 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.

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Biology – Living Things and their Habitats	frogspawn tadpole butterfly frog spider ladybird etc. home lives lifecycle grow change	habitats, lifecycles food nests dens hole Hot Cold Arctic Desert Sea Ocean Jungle Wood Forest Scales feathers		Living Dead Habitat Energy Food chain Predator Prey Woodland Pond Desert		Vertebrates Fish Amphibians Reptiles Birds Mammals Invertebrates Snails Slugs Worms Spiders Insects Environment Habitats classification keys classify characteristics environment environmental dangers adapt natural changes climate change deforestation pollution urbanisation invasive species endangered species extinct	Mammal Reproduction Insect Amphibian Bird Offspring Classification Vertebrates Invertebrates Microorganisms Amphibians Reptiles Mammals Insects	Linnaean system flowering and non-flowering plants variation bacteria single-celled microbes microscopic virus fungi fungus mould antibiotic yeast ferment microscope decompose

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	Begin to understand the need to respect and care for the natural environment and all living things	Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class		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,		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 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 microorganisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics

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				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				
Biology – Evolution and Inheritance								Fossils Adaptation Evolution Characteristics Reproduction Genetics evolve adaptation inherit natural selection adaptive traits inherited traits mutations theory of evolution ancestors biological parent

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								chromosomes genes Charles Darwin
								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

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								environment in different ways and that adaptation may lead to evolution.

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Chemistry - Materials	material wood glass paper hard soft	Metal rock plastic fabric smooth shiny rough	Everyday Materials Wood Plastic Glass Paper Water Metal Rock Hard Soft Bendy Rough Smooth	Materials Hard Soft Stretchy Stiff Shiny Dull Rough Smooth Bendy Waterproof Absorbent Opaque Transparent Brick Paper Fabrics Squashing Bending Twisting		States of Matter Solid Liquid Gas Evaporation Condensation Particles Temperature Freezing Heating Precipitation	Properties, including changes of, materials Hardness Solubility Transparent Opaque Translucent Magnetic Filter Evaporation Dissolving Mixing Thermal conductor thermal insulator electrical conductor	

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				Stretching Elastic Foil			electrical insulator	
	Use all their senses in hands-on exploration of natural materials Explore collections of materials with similar or different properties Talk about what they see, using a wide vocabulary Talk about the differences between materials and changes they notice	Explore the natural world around them	**<u>Everyday Materials</u>** 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	**<u>Use of Everyday Materials</u>** 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.		**<u>States of matter</u>** 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	**<u>Properties and changes of Materials</u>** 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	

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			materials on the basis of their simple physical properties.			and associate the rate of evaporation with temperature.	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	

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							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	
Chemistry- Rocks	Natural Shells Pebbles Stones	Smooth Sharp Large Small			Fossils Soils Sandstone Granite Marble Pumice Crystals sedimentary metamorphic igneous absorbent/porous durable permeable impermeable			

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	Use all their senses in hands-on exploration of natural materials Explore collections of materials with similar or different properties Talk about what they see, using a wide vocabulary Talk about the differences between materials and changes they notice	Explore the natural world and describe the size and appearance of different rocks Explore animals that could use rocks as a habitat			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.			

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Physics- Seasonal Change		Summer Spring dark Autumn light Winter night Season Moon Sun	Year Months days Hot Warm Mild Cold Sunny Cloudy Rain Sleet Snow Hail thunder lightning rainbow wet damp dry windy breezy gust temperature degrees Celsius thermometer weather vane anemometer					
		Understand the effect of changing seasons on the natural world around them	Name seasons and observe changes Observe and describe					

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			weather associated with the seasons and how day length varies.					
Physics - Light	Shine Light Dark Bright Dim shadow				light source dark absence of light surface shadow reflect mirror Sun Sunlight dangerous opaque transparent translucent reflective non-reflective			Reflection: periscope. Seeing light: visible spectrum, prism how light travels: light waves, wavelength, straight line, refraction. straight lines, light rays refraction optic nerve
					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 appears to travel in straight lines Use the idea that light travels in straight lines to explain that

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					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 solid objects. Find patterns in the way that the size of shadows changes.			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
	Push Pull Fall				movement surface distance strength push pull		air resistance water resistance buoyancy up thrust	

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Physics - Forces					contact force non-contact force friction magnet magnetic field magnetic force bar magnet horseshoe magnet ring magnet magnetic poles (north pole, south pole) attract repel compass		Earth's gravitational pull Gravity opposing forces driving force levers pulleys gears/cogs weight mass kilograms (kg) Newton's (N) scales speed fast slow	
	Explore and talk about different forces they can feel				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		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	

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					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.		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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Physics - Sound	loud quiet volume sound	Bang Explosion Tune Soft				Eardrum Vibration vocal cords particles pitch volume amplitude sound wave quiet loud high low travel distance soundproof absorb sound		
						Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear.		

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						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.		
						mains-powered battery-powered mains electricity plug appliances devices circuit simple series circuit		Voltage Amps resistance electrons volts (V) current symbol circuit diagram component function filament

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Physics - Electricity						complete circuit incomplete circuit bulb cell wire buzzer switch motor battery electrical conductor electrical insulator safety		dimmer brighter louder quieter natural electricity human-made electricity solar panels power station positive negative
						Identify common appliances that run on electricity Construct a simple series circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not the lamp		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

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						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.		bulbs, the loudness of buzzers and the on/off position of switches Use recognised symbols when representing a simple circuit in a diagram
Physics – Earth and Space							Solar system: star, planet. Names of planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus.	

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							Shape: spherical bodies, sphere. Movement: rotate, axis, orbit, satellite. Theories: geocentric model, heliocentric model, astronomer. Day length: sunrise, sunset, midday, time zone.	
							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.	

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							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.	