



# Sacred Heart RC Primary School

'Where Every Heart is Sacred'

## Whole-School Curriculum Progression Map: Science

### Intent

The Science curriculum at Sacred Heart is vibrant and we provide children with an exciting learning environment where they can answer their own questions about the world around them. Taught weekly, our curriculum provides a rich variety of topics that cover all the core scientific disciplines of physics, biology and chemistry. Children explore and learn in science using a variety of investigative skills, engaging with and developing the elements of working scientifically. This includes skills such as experimenting with their own lines of enquiry, making predictions, analysing results, observing changes over time, collecting results in a variety of ways, drawing conclusions from their observations and evaluating their own method and the reliability of their results. Within each unit studied, children will build on their prior learning while developing new scientific vocabulary. Science education at Sacred Heart inspires the development of scientific knowledge through the practical nature of the subject. Children develop their scientific skills utilising the classroom, wider school environment, the local environment and far beyond. Children are equipped with the scientific knowledge they require to understand the importance of science in today's world and that of the future.

### Implementation

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following:

- Weekly lessons of carefully planned and arranged topic blocks by the class teacher. This is a strategy to enable the achievement of a greater depth of knowledge which supports long term memory through regular looping. Topics are revisited and knowledge developed across each phase through focused science events and projects.
- Existing knowledge is checked at the beginning of each topic. This ensures that teaching is informed by the children's starting points and that it takes account of pupil voice, incorporating children's interests.
- Through our planning, we ensure problem solving opportunities that allow children to apply their knowledge and find out answers for themselves. Children are encouraged to ask their own questions and are given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within and beyond the classroom. Teachers plan engaging lessons often involving visits to farms, science museums, universities, the feeder high school and a range of other learning establishments. They use high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills and assess pupils regularly to identify those children with gaps in learning so that all pupils keep up. Tasks are selected and designed to provide appropriate challenge to all learners in line with the school's commitment to inclusion.
- We build upon the knowledge and skills gained in previous years. As the children's knowledge and understanding increases, they become more proficient in selecting and using scientific equipment and collating and interpreting results. They become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Working scientifically, skills are embedded into lessons to ensure that they are systematically developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
- Children are offered a wide range of extra-curricular activities, visits, trips and science themed weeks to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.
- At the end of each topic, key knowledge is reviewed by the children and rigorously checked by the teacher and consolidated as necessary.

### Impact

The impact of science lessons at Sacred Heart is measured by assessing children's new knowledge, understanding and skills and their ability to use and recall this with fluency. This will be monitored by:

- Regular knowledge check activities.
- In school attainment tracking of both core and foundation subjects.
- Engagement in Science enrichment activities.
- Pupil voice – questionnaires, pupil book and learning reviews
- Subject Leader monitoring – Lesson visits, scrutiny of books, assessment, pupil interviews and questionnaires
- Governor monitoring

The Science curriculum and resources are evaluated annually.



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	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals Including Humans	<ul style="list-style-type: none"> <li>• Make healthy choices about food, drink, activity and toothbrushing.</li> <li>• Begin to make sense of their own life-story and family's history.</li> <li>• Understand the key features of the life cycle of a plant and an animal.</li> <li>• Learn new vocabulary.</li> <li>• Know and talk about the different factors that support their overall health and wellbeing:               <ul style="list-style-type: none"> <li>- regular physical activity</li> <li>- healthy eating</li> <li>- toothbrushing</li> <li>- sensible amounts of 'screen time'</li> <li>- having a good sleep routine</li> <li>- being a safe pedestrian</li> </ul> </li> <li>• Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.</li> </ul>	<ul style="list-style-type: none"> <li>• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>• identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</li> <li>• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</li> </ul>	<ul style="list-style-type: none"> <li>• notice that animals, including humans, have offspring which grow into adults</li> <li>• find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>• describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> </ul>	<ul style="list-style-type: none"> <li>• 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</li> <li>• identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul>	<ul style="list-style-type: none"> <li>• describe the simple functions of the basic parts of the digestive system in humans</li> <li>• identify the different types of teeth in humans and their simple functions</li> <li>• construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>	<ul style="list-style-type: none"> <li>• describe the changes as humans develop to old age.</li> </ul>	<ul style="list-style-type: none"> <li>• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>• describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul>



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Plants	<ul style="list-style-type: none"><li>• Plant seeds and care for growing plants.</li><li>• Learn new vocabulary.</li></ul>	<ul style="list-style-type: none"><li>• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees;</li><li>• identify and describe the basic structure of a variety of common flowering plants, including trees.</li></ul>	<ul style="list-style-type: none"><li>• observe and describe how seeds and bulbs grow into mature plants;</li><li>• find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li></ul>	<ul style="list-style-type: none"><li>• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers;</li><li>• 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;</li><li>• investigate the way in which water is transported within plants;</li><li>• explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li></ul>			
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Living Things and Their Habitats	<ul style="list-style-type: none"> <li>Begin to understand the need to respect and care for the natural environment and all living things.</li> <li>Explore the natural world around them, making observations and drawing pictures of animals and plants.</li> <li>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.</li> <li>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</li> </ul>		<ul style="list-style-type: none"> <li>explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>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.</li> <li>identify and name a variety of plants and animals in their habitats, including microhabitats.</li> <li>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.</li> </ul>		<ul style="list-style-type: none"> <li>recognise that living things can be grouped in a variety of ways;</li> <li>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment;</li> <li>recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>	<ul style="list-style-type: none"> <li>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</li> <li>describe the life process of reproduction in some plants and animals.</li> </ul>	<ul style="list-style-type: none"> <li>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;</li> <li>give reasons for classifying plants and animals based on specific characteristics.</li> </ul>
Evolution and Inheritance							<ul style="list-style-type: none"> <li>recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago;</li> <li>recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</li> <li>identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li> </ul>



	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasonal Changes	<ul style="list-style-type: none"> <li>• Explore the natural world around them.</li> <li>• Describe what they see, hear and feel while they are outside.</li> <li>• Recognise some environments that are different to the one in which they live.</li> <li>• Understand the effect of changing seasons on the natural world around them.</li> </ul>	<ul style="list-style-type: none"> <li>• observe changes across the 4 seasons;</li> <li>• observe and describe weather associated with the seasons and how day length varies.</li> </ul>					
Forces	<ul style="list-style-type: none"> <li>• Explore and talk about different forces they can feel.</li> </ul>			<ul style="list-style-type: none"> <li>• compare how things move on different surfaces.</li> <li>• notice that some forces need contact between 2 objects, but magnetic forces can act at a distance.</li> <li>• observe how magnets attract or repel each other and attract some materials and not others.</li> <li>• 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.</li> <li>• describe magnets as having 2 poles.</li> <li>• predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</li> </ul>		<ul style="list-style-type: none"> <li>• explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object.</li> <li>• identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</li> <li>• recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</li> </ul>	



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Light				<ul style="list-style-type: none"><li>• recognise that they need light in order to see things and that dark is the absence of light.</li><li>• notice that light is reflected from surfaces.</li><li>• recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</li><li>• recognise that shadows are formed when the light from a light source is blocked by an opaque object.</li><li>• find patterns in the way that the size of shadows change.</li></ul>			<ul style="list-style-type: none"><li>• recognise that light appears to travel in straight lines;</li><li>• 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;</li><li>• 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.</li><li>• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li></ul>
Sound					<ul style="list-style-type: none"><li>• identify how sounds are made, associating some of them with something vibrating.</li><li>• recognise that vibrations from sounds travel through a medium to the ear.</li><li>• find patterns between the pitch of a sound and features of the object that produced it.</li><li>• find patterns between the volume of a sound and the strength of the vibrations that produced it;</li><li>• recognise that sounds get fainter as the distance from the sound source increases.</li></ul>		



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Earth and Space						<ul style="list-style-type: none"><li>• describe the movement of the Earth and other planets relative to the sun in the solar system.</li><li>• describe the movement of the moon relative to the earth.</li><li>• describe the sun, earth and moon as approximately spherical bodies.</li><li>• use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li></ul>	
Electricity					<ul style="list-style-type: none"><li>• identify common appliances that run on electricity.</li><li>• construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</li><li>• 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.</li><li>• recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</li><li>• recognise some common conductors and insulators, and associate metals with being good conductors.</li></ul>		<ul style="list-style-type: none"><li>• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</li><li>• 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</li><li>• use recognised symbols when representing a simple circuit in a diagram.</li></ul>



	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Materials	<ul style="list-style-type: none"> <li>• Use all their senses in hands-on exploration of natural materials.</li> <li>• Explore collections of materials with similar and/or different properties.</li> <li>• Talk about the differences between materials and changes they notice.</li> <li>• Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</li> </ul>	<ul style="list-style-type: none"> <li>• distinguish between an object and the material from which it is made.</li> <li>• identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>• describe the simple physical properties of a variety of everyday materials</li> <li>• compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> </ul>	<ul style="list-style-type: none"> <li>• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>• find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul>	<ul style="list-style-type: none"> <li>• compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>• describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>• recognise that soils are made from rocks and organic matter.</li> </ul>	<ul style="list-style-type: none"> <li>• compare and group materials together, according to whether they are solids, liquids or gases</li> <li>• 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)</li> <li>• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<ul style="list-style-type: none"> <li>• 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;</li> <li>• know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>• use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>• demonstrate that dissolving, mixing and changes of state are reversible changes;</li> <li>• 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.</li> </ul>	



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Scientific Enquiry Skills	<ul style="list-style-type: none"> <li>• Talk about what they see, using a wide vocabulary.</li> <li>• Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"</li> <li>• Explore how things work.</li> <li>• Ask questions to find out more and to check what has been said to them.</li> <li>• Articulate their ideas and thoughts in well-formed sentences.</li> <li>• Describe events in some detail.</li> <li>• Use talk to work out problems and organise thinking and activities. Explain how things work and why they might happen.</li> <li>• Use new vocabulary in different contexts.</li> <li>• Make comments about what they have heard and ask questions to clarify their understanding.</li> </ul>	<ul style="list-style-type: none"> <li>• Ask simple questions and recognise that they can be answered in different ways</li> <li>• Use simple equipment to observe closely</li> <li>• Perform simple tests</li> <li>• Identify and classify</li> <li>• Use his/her observations and ideas to suggest answers to questions</li> <li>• Gather and record data to help in answering questions</li> </ul>	<ul style="list-style-type: none"> <li>• Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum</li> <li>• Use simple equipment to observe closely including changes over time</li> <li>• Perform simple comparative tests</li> <li>• Identify, group and classify</li> <li>• Use his/her observations and ideas to suggest answers to questions noticing similarities, differences and patterns</li> <li>• Gather and record data to help in answering questions including from secondary sources of information</li> </ul>	<ul style="list-style-type: none"> <li>• Ask relevant questions and use different types of scientific enquiries to answer them</li> <li>• Set up simple practical enquiries, comparative and fair tests</li> <li>• Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>• Gather, record, classify and present data in a variety of ways to help in answering questions</li> <li>• Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>• Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>• Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>• Identify differences, similarities or changes related to simple scientific ideas and processes</li> <li>• Use straightforward</li> </ul>	<ul style="list-style-type: none"> <li>• Ask relevant questions and use different types of scientific enquiries to answer them</li> <li>• Set up simple practical enquiries, comparative and fair tests</li> <li>• Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>• Gather, record, classify and present data in a variety of ways to help in answering questions</li> <li>• Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>• Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>• Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>• Identify differences, similarities or changes related to simple scientific ideas and processes</li> <li>• Use straightforward</li> </ul>	<ul style="list-style-type: none"> <li>• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>• Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>• Use test results to make predictions to set up further comparative and fair tests</li> <li>• Report and present 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</li> <li>• Identify scientific evidence that has been used to support or refute ideas or arguments</li> </ul>	<ul style="list-style-type: none"> <li>• Plan different types of scientific enquiries to answer their own or others' questions, including recognising and controlling variables where necessary (Year 6 focus)</li> <li>• Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate (Year 6 focus)</li> <li>• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (Year 6 focus)</li> <li>• Use test results to make predictions to set up further comparative and fair tests (Year 6 focus)</li> <li>• Report and present 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</li> <li>• Describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources</li> </ul>



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			scientific evidence to answer questions or to support his/her findings	scientific evidence to answer questions or to support his/her findings		• Group and classify things and recognise patterns
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