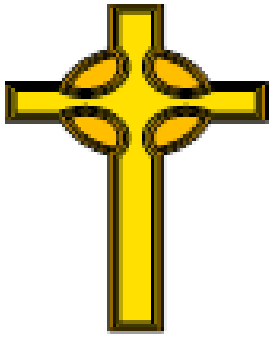
Holy Cross Catholic Primary School



Science long term plan & progression of scientific skills 2024 – 2025

'We care, we share, we value.'

	Autumn	Spring	Summer
Early Years Foundation Stage	• Notices detailed features of objects in their environment • Can talk about some of the things they have observed such as plants, animals, natural and found objects **Asking Scientific Questions** • to comment and ask questions about aspects of their familiar world such as the place where they live or the natural world;	• Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world • Talks about why things happen and how things work • Developing an understanding of growth, decay and changes over time • Shows care and concern for living things and the environment • Begin to understand the effect their behaviour can have on the environment **Observing and Measuring Changes** • Can talk about some of the things they have observed such as plants, animals, natural and found objects • Show care and concern for living things and the environment.	• Looks closely at similarities, differences, patterns and change in nature • Knows about similarities and differences in relation to places, objects, materials and living things • Talks about the features of their own immediate environment and how environments might vary from one another • Makes observations of animals and plants **Drawing Conclusions, Noticing Patterns and Presenting Findings** • To begin to talk about why things happen and how things work.

Reception	**Autumn**	**Spring**	**Summer**
Progression of skills Reception	• Looks closely at similarities, differences, patterns and change in nature • Knows about similarities and differences in relation to places, objects, materials and living things • Talks about the features of their own immediate environment and how environments might vary from one another • Makes observations of animals and plants and explains why some things occur, and talks about changes **Asking Scientific Questions** • To explore the world around them, leading them to ask some simple scientific questions about how and why;	• Explore the natural world around them, making observations and drawing pictures of animals and plants. • 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 • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. **Carry out Fair Testing** • To say what they think will happen • Talk about what they can see and changes • Play with scientific equipment. **Observing and Measuring Changes**	

			• To draw pictures of things they see; • Talk about what they can see; • Begin to make marks to collect data; • Make observations about animals and plants **Identifying, Classifying, Recording and Presenting Data** • Begin to make marks to collect data.			
Year 1	**Autumn 1** **Materials** **Seasonal change**	**Autumn 2** **Materials** **Seasonal change**	**Spring 1** **Plants** **Seasonal change**	**Spring 2** **Plants** **Seasonal change**	**Summer 1** **Animals inc humans** **Seasonal change**	**Summer 2** **Animals inc humans** **Seasonal change**
Curriculum	• 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		• 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		• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • Identify and name a variety of common animals that are carnivores, herbivores and omnivores • Identify, name, draw and label the basic parts of the human body and say which part of the	

	• Compare and group together a variety of everyday materials on the basis of their simple physical properties		body is associated with each sense.
Progression of skills Year 1	**Asking scientific Questions:** • -to ask simple questions and recognise that they can be answered in different ways; • -perform simple tests with support; • -explore the world around them, leading them to ask some simple scientific questions about how and why things happen; • -begin to recognise ways in which they might answer scientific questions; • ask people questions and use simple secondary sources to find answers, with support **Carry out fair testing:** • to carry out simple practical tests, using simple equipment, with support; • experience different types of scientific enquiries, including practical activities; • with support, talk about the aim of scientific tests they are working on; • with support, start to recognise a fair test.		

	Observing and measuring changes: • to observe closely, using simple equipment, with support; • -observe the natural and humanly constructed world around them; • observe changes over time; • -use simple measurements and equipment, with support; • -make careful observations, sometimes using equipment to help them observe carefully, with support. **Identifying, Classifying, Recording and Presenting Data** • to identify and classify; • -gather and record data to help in answering questions; • -to begin to use simple features to compare objects, materials and living things; • -decide how to sort and classify objects into simple groups with some help; • -record and communicate findings in a range of ways with support; • -sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables, with support. **Drawing Conclusions, Noticing Patterns and Presenting Findings** • to use their observations and ideas to suggest answers to questions, with some help; • notice links between cause and effect with support; • begin to notice patterns and relationships with support •

	• -begin to draw simple conclusions; • -identify and discuss differences between their results, with support; • -use simple and scientific language; • -read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; • -talk about their findings to a variety of audiences in a variety of ways. • **Using Scientific Evidence and secondary sources of information** • To use simple secondary sources to find answers with support.

Year 2	**Autumn 1** **Living things and their habitats**	**Autumn 2** Animals inc humans	**Spring 1** Animals inc humans	**Spring 2** **Plants**	**Summer 1**	**Summer 2** Everyday materials
Curriculum	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	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		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 stay healthy.		Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses

	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, 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				Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
Progression of skills Year 2	**Asking scientific Questions:** • -to ask simple questions and recognise that they can be answered in different ways; • -perform simple tests with support; • -explore the world around them, leading them to ask some simple scientific questions about how and why things happen; • -begin to recognise ways in which they might answer scientific questions; • ask people questions and use simple secondary sources to find answers, with support				

	Carry out fair testing: • to carry out simple practical tests, using simple equipment, with support; • experience different types of scientific enquiries, including practical activities; • with support, talk about the aim of scientific tests they are working on; • with support, start to recognise a fair test. **Observing and measuring changes:** • to observe closely, using simple equipment, with support; • -observe the natural and humanly constructed world around them; • observe changes over time; • -use simple measurements and equipment, with support; • -make careful observations, sometimes using equipment to help them observe carefully, with support. **Identifying, Classifying, Recording and Presenting Data** • to identify and classify; • -gather and record data to help in answering questions; • -to begin to use simple features to compare objects, materials and living things; • -decide how to sort and classify objects into simple groups with some help; • -record and communicate findings in a range of ways with support; • -sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables, with support.

	Drawing Conclusions, Noticing Patterns and Presenting Findings • to use their observations and ideas to suggest answers to questions, with some help; • notice links between cause and effect with support; • begin to notice patterns and relationships with support • • -begin to draw simple conclusions; • -identify and discuss differences between their results, with support; • -use simple and scientific language; • -read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; • -talk about their findings to a variety of audiences in a variety of ways. **Using Scientific Evidence and secondary sources of information** • To use simple secondary sources to find answers with support.

Year 3	Autumn 1 Rocks	Autumn 2 Plants	Spring 1 Plants	Spring 2 Animals inc humans	Summer 1 Light	Summer 2 Forces
Curriculum	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	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		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	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	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 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

				Find patterns in the way that the size of shadows change	Describe magnets as having 2 poles Predict whether 2 magnets will attract or repel each other, depending on which poles are facing
Progression of skills Year 3	**Asking Scientific Questions** • To begin to ask relevant questions and use different types of scientific enquiries to answer them; • Begin to set up simple practical enquiries, comparative and fair tests; • Start to raise their own relevant questions about the world around them in response to a range of scientific experiences; • Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions **Carry out fair testing:** • to carry out simple practical tests, using simple equipment, with support; • experience different types of scientific enquiries, including practical activities; • with support, talk about the aim of scientific tests they are working on; **Observing and measuring changes:** • to observe closely, using simple equipment, with support; • observe the natural and humanly constructed world around them; • observe changes over time;				

	• use simple measurements and equipment, with support; • make careful observations, sometimes using equipment to help them observe carefully, with support. **Identifying, Classifying, Recording and Presenting Data** • to identify and classify; • gather and record data to help in answering questions; • to begin to use simple features to compare objects, materials and living things; • decide how to sort and classify objects into simple groups with some help; • record and communicate findings in a range of ways with support; • sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables, with support. **Drawing Conclusions, Noticing Patterns and Presenting Findings** • to use their observations and ideas to suggest answers to questions, with some help; • notice links between cause and effect with support; • begin to notice patterns and relationships with support; • begin to draw simple conclusions; • identify and discuss differences between their results, with support; • use simple and scientific language; • read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1;

	• talk about their findings to a variety of audiences in a variety of ways. **Using Scientific Evidence and secondary sources of information** • To use simple secondary sources to find answers with support.					
Year 4	**Autumn 1** Living things	**Autumn 2** Electricity	**Spring 1** Humans: Teeth & eating	**Spring 2** Sounds	**Summer 1** States of matter	**Summer 2**
Curriculum	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	Identify common appliances that run on electricity 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	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	Identify how sounds are made, associating some of 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	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	

		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		Recognise that sounds get fainter as the distance from the sound source increases	and associate the rate of evaporation with temperature	
Progression of skills Year 4	**Asking Scientific Questions** • To ask relevant questions and use different types of scientific enquiries to answer them; • Set up simple practical enquiries, comparative and fair tests; • Raise their own relevant questions about the world around them in response to a range of scientific experiences; • Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions **Carry out Fair Testing** • To recognise when a fair test is necessary; • Help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used, with increasing confidence; • Set up and carry out simple comparative and fair tests. **Observing and Measuring Changes**					

	• To make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers; • Make systematic and careful observations; • Observe changes over time; • Use a range of equipment, including thermometers and data loggers; • Ask their own questions about what they observe; • Where appropriate, take accurate measurements using standard units using a range of equipment. **Identifying, Classifying, Recording and Presenting Data** • To gather, record, classify and present data in a variety of ways to help in answering questions; • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables; • Talk about criteria for grouping, sorting and classifying; • Group and classify things; • Collect data from their own observations and measurements; • Present data in a variety of ways to help in answering questions • Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; • Record findings using scientific language, drawings, labelled diagrams, keys, bar **Drawing Conclusions, Noticing Patterns and Presenting Findings** • To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions;

	• To report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions; • Draw simple conclusions from their results; • Make predictions; • Suggest improvements to investigations; • Raise further questions which could be investigated; • First talk about, and then go on to write about, what they have found out; • Report and present their results and conclusions to others in written and oral forms with increasing confidence. **Using Scientific Evidence and Secondary Sources of Information** • To identify differences, similarities or changes related to simple scientific ideas and processes; • Use straightforward scientific evidence to answer questions or to support their findings; • Make links between their own science results and other scientific evidence; • Use straightforward scientific evidence to answer questions or support their findings; • Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; • Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations

Year 5	Autumn 1 Earth and space	Autumn 2 Forces	Spring 1 Change from birth to old age	Spring 2 Life cycles	Summer 1 Properties and changes of materials Summer 2
Curriculum	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	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	Describe the changes as humans develop to old age	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 animal	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 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

	the sun across the sky	force to have a greater effect			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
Progression of skills Year 5	**Asking Scientific Questions** • To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary; • Begin to use test results to make predictions to set up further comparative and fair tests; • With growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; • With increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; • Explore and talk about their ideas, raising different kinds of scientific questions; • Ask their own questions about scientific phenomena **Carry out Fair Testing** • To select and plan the most appropriate type of scientific enquiry to use to answer scientific questions;				

	• Make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; • Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary; • Use their test results to identify when further tests and observations may be needed; • Use test results to make predictions for further tests. **Observing and Measuring Changes** • To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate; • Choose the most appropriate equipment to make measurements and explain how to use it accurately; • Take measurements using a range of scientific equipment with increasing accuracy and precision; • Take repeat readings when appropriate; • Understand why we take an average in repeat readings. • **Identifying, Classifying, Recording and Presenting Data** • To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Independently group, classify and describe living things and materials; • Use and develop keys and other information records to identify, classify and describe living things and materials; • Decide how to record data from a choice of familiar approaches; • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.

	Drawing Conclusions, Noticing Patterns and Presenting Findings • To report and present 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 presentations; • Notice patterns; • Draw conclusions based in their data and observations; • Use their scientific knowledge and understanding to explain their findings; • Read, spell and pronounce scientific vocabulary correctly; • Identify patterns that might be found in the natural environment; • Look for different causal relationships in their data; • Discuss the degree of trust they can have in a set of results; • Independently report and present their conclusions to others in oral and written forms. **Using Scientific Evidence and Secondary Sources of Information** • To identify scientific evidence that has been used to support or refute ideas or arguments; • Use primary and secondary sources of evidence to justify ideas; -identify evidence that refutes or supports their ideas; • Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; • Talk about how scientific ideas have developed over time

Year 6	**Autumn 1** Living things and their habitats	**Autumn 2** **Animals inc humans**	**Spring 1 Spring 2** Evolution and inheritance	**Summer 1** **Electricity**	**Summer 2** **Light**
Curriculum	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 Give reasons for classifying plants and animals based on specific characteristics	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	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	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	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 Use the idea that light travels in

					straight lines to explain why shadows have the same shape as the objects that cast them
Progression of skills Year 6	**Asking Scientific Questions:** • To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary with increasing confidence; • Use test results to make predictions to set up further comparative and fair tests. • With growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; **Carry out Fair Testing** • To select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; • Make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; • Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary; • Use their test results to identify when further tests and observations may be needed; • Use test results to make predictions for further tests **Observing and Measuring Changes**				

	• To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate; • Choose the most appropriate equipment to make measurements and explain how to use it accurately; • Take measurements using a range of scientific equipment with increasing accuracy and precision; • Take repeat readings when appropriate; • Understand why we take an average in repeat readings. **Identifying, Classifying, Recording and Presenting Data** • To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Independently group, classify and describe living things and materials; • Use and develop keys and other information records to identify, classify and describe living things and materials; • Decide how to record data from a choice of familiar approaches; • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. **Drawing Conclusions, Noticing Patterns and Presenting Findings** • To report and present 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 presentations; • Notice patterns; • Draw conclusions based in their data and observations; • Use their scientific knowledge and understanding to explain their findings;

	• Read, spell and pronounce scientific vocabulary correctly; • Identify patterns that might be found in the natural environment; • Look for different causal relationships in their data; • Discuss the degree of trust they can have in a set of results; • Independently report and present their conclusions to others in oral and written forms **Using Scientific Evidence and Secondary Sources of Information** • To identify scientific evidence thar has been used to support or refute ideas or arguments; • Use primary and secondary sources of evidence to justify ideas; • Identify evidence that refutes or supports their ideas; • Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; • Talk about how scientific ideas have developed over time.