Emmaus

Church of England and Catholic Primary School

Travelling together with Jesus

Science Progression Map

Progression of skills and knowledge in Science		
Three and Four-Year-Olds	Communication and Language	• Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
	Personal, Social and Emotional Development	• Make healthy choices about food, drink, activity and toothbrushing.
	Understanding the World	• Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about what they see, using a wide vocabulary. • Begin to make sense of their own life-story and family's history. • Explore how things work. • Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice.
Reception	Communication and Language	• Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • Use new vocabulary in different contexts.

Reception Continued	Personal, Social and Emotional Development			• Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian		
	Understanding the World			• Explore the natural world around them. • Describe what they see, hear and feel while they are outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.		
ELG	Communication and Language	Listening, Attention and Understanding		• Make comments about what they have heard and ask questions to clarify their understanding.		
	Personal, Social and Emotional Development	Managing Self		• Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.		
	Understanding the World	The Natural World		• 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.		
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic	**Plants**					
Objectives	**Pupils should be taught to:** Identify and name a variety of common wild and garden plants, including deciduous and	**Pupils should be taught to:** Observe and describe how seeds and bulbs grow into mature plants Find out and describe how plants need water, light and a suitable	**Pupils should be taught to:** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers			

	evergreen trees **I**dentify and describe the basic structure of a variety of common flowering plants, including trees. **<u>Working scientifically</u>** Observing closely, using simple equipment Identifying and classifying Gathering and recording data to help in answering questions.	temperature to grow and stay healthy. **<u>Working scientifically</u>** Observing closely, using simple equipment Asking simple questions and recognising that they can be answered in different ways Performing simple tests Using their observations and ideas to suggest answers to questions	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. **<u>Working scientifically</u>** Asking relevant questions and using different types of scientific enquiries to answer them 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 Using straightforward scientific evidence to answer questions or to support their findings.			
	Animals, including humans					
Objectives	**Pupils should be taught to:** Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common	**Pupils should be taught to:** 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	**Pupils should be taught to:** 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	**Pupils should be taught to:** 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. **Working scientifically** Asking relevant questions and using different types of scientific enquiries to answer them	**Pupils should be taught to:** Describe the changes as humans develop to old age. **Working scientifically** 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	**Pupils should be taught to:** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels 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.

	animals that are carnivores, herbivores and omnivores **Working scientifically** Observing closely, using simple equipment Identifying and classifying Gathering and recording data to help in answering questions.	of different types of food, and hygiene. **Working scientifically** Identifying and classifying Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions. Observing closely, using simple equipment	skeletons and muscles for support, protection and movement. **Working scientifically** Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions 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 Using results to draw simple conclusions, make predictions for new values, suggest	Setting up simple practical enquiries, comparative and fair tests 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	precision, taking repeat readings when appropriate 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 Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	**Working scientifically** 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 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

			improvements and raise further questions Using straightforward scientific evidence to answer questions or to support their findings.			

	Everyday materials					
Objectives	**<u>Pupils should be taught to:</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 **<u>Working scientifically</u>** Observing closely, using simple equipment Identifying and classifying Performing simple tests Asking simple questions and recognising that they can be answered in different ways Using their observations and ideas to suggest answers to questions	**<u>Pupils should be taught to:</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>Working scientifically</u>** Identifying and classifying Asking simple questions and recognising that they can be answered in different ways			**<u>Pupils should be taught to:</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 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,	

	Gathering and recording data to help in answering questions.	Observing closely, using simple equipment Performing simple tests Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions.			for the particular uses of everyday materials, including metals, wood and plastic 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. **<u>Working scientifically</u>** Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 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.	

					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 Using test results to make predictions to set up further comparative and fair tests	

	Seasonal changes					
Objectives	**<u>Pupils should be taught to:</u>** Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies. **<u>Working scientifically</u>** Observing closely, using simple equipment Using their observations and ideas to suggest answers to questions					

	Gathering and recording data to help in answering questions. Asking simple questions and recognising that they can be answered in different ways					

	Living things and their habitats					
Objectives		**Pupils should be taught to:** 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, including micro-habitats 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.		**Pupils should be taught to:** 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. **Working scientifically** Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using	**Pupils should be taught to:** 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. **Working scientifically** 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 Using test results to make predictions to set up	**Pupils should be taught to:** Describe how living things are classified into broad groups according to common observable Give reasons for classifying plants and animals based on specific characteristics characteristics and based on similarities and differences, including micro-organisms, plants and animals **Working scientifically** Identifying scientific evidence that has been used to support or refute ideas or arguments. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

		<u>Working scientifically</u> Identifying and classifying Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions. Observing closely, using simple equipment		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 Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Using straightforward scientific evidence to answer questions or to support their findings.	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 Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Identifying scientific evidence that has been used to support or refute ideas or arguments	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 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 Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Using test results to make predictions to set up further comparative and fair tests

	Rocks					
Objectives			**<u>Pupils should be taught to:</u>** 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 **<u>Working scientifically</u>** Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Setting up simple practical enquiries, comparative and fair tests			

	Light					
Objectives			**Pupils should be taught to:** 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 shadows are formed when the light from a light source is blocked by a solid object Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Find patterns in the way that the size of shadows change. **Working scientifically** Setting up simple practical enquiries, comparative and fair tests Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions			**Pupils should be taught to:** 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 Recognise that light appears to travel in straight lines **U**se the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Working scientifically** Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Planning different types of scientific enquiries to answer questions, including recognising and

			Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions			controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

Objectives	**Forces and magnets**					
			<u>Pupils should be taught to:</u> Compare how things move on different surfaces Notice that some forces need contact between two objects, but magnetic forces can act at a distance Describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing. Observe how magnets attract or repel each other		**<u>Pupils should be taught to:</u>** 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 force to have a greater effect.	

			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 **Working scientifically** 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 Setting up simple practical enquiries, comparative and fair tests Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Using straightforward scientific evidence to answer questions or to support their findings. Identifying differences, similarities or changes		**Working scientifically** Identifying scientific evidence that has been used to support or refute ideas or arguments. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate 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 Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Using test results to make predictions to set up further comparative and fair tests Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	

			related to simple scientific ideas and processes Asking relevant questions and using different types of scientific enquiries to answer them			

	States of Matter					
Objectives				**<u>Pupils should be taught to:</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 and associate the rate of evaporation with temperature. **<u>Working scientifically</u>** Identifying differences, similarities or changes related to simple scientific ideas and processes		

				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 Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions		

	Sound					
Objectives				**<u>Pupils should be taught to:</u>** 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 Recognise that sounds get fainter as the distance from the sound source increases. **Working scientifically** Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Setting up simple practical enquiries, comparative and fair tests Identifying differences, similarities or changes related to simple scientific ideas and processes		

	Electricity					
Objectives				**Pupils should be taught to:** 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		**Pupils should be taught to:** Use recognised symbols when representing a simple circuit in a diagram. 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,

				whether or not the lamp is part of a complete loop with a battery Recognise some common conductors and insulators, and associate metals with being good conductors. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit **Working scientifically** Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Using straightforward scientific evidence to answer questions or to support their findings. Asking relevant questions and using different types of scientific enquiries to answer them Identifying differences, similarities or changes related to simple scientific ideas and processes		including the brightness of bulbs, the loudness of buzzers and the on/off position of switches **Working scientifically** Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary 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 Taking measurements, using a range of scientific equipment, with

						increasing accuracy and precision, taking repeat readings when appropriate

	Earth and Space					
Objectives					**<u>Pupils should be taught to:</u>** Describe the Sun, Earth and Moon as approximately spherical bodies Describe the movement of the Earth, and other planets, relative to the Sun in the solar system Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Describe the movement of the Moon relative to the Earth **<u>Working scientifically</u>** Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	

					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	

	Evolution and inheritance					
Objectives						**Pupils should be taught to:** 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. **Working scientifically**

						Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary 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