



Our Lady of Lourdes Skills Progression Map – Science

Curriculum Intent for Science

Live: We live to value, respect and understand the magnificence and inter connectedness of our world and all its creatures. We live curiously, always observing, questioning, investigating and appreciating the importance of Science in our everyday lives. We live with accountability knowing that we are responsible and capable to care for our earth and all the treasures and wonders it beholds.

Love: We love all beings and matter that exists in our world, aware and in awe of its perfection and power. In love, we seek to value, understand, respect and care for living organisms, the physical environment and all that exists.

Learn: We learn to be critical thinkers with a joy and enthusiasm for scientific knowledge and discovery. We learn, through inquiry and investigation, the implications of Science in the past, today and for our future. We learn to use Science to improve and grow our world in positive and sustainable ways for all life.

Greater Depth within the Science Curriculum

In order to enable opportunities for 'Greater Depth' we need to provide rich, purposeful learning which promotes relationships, curiosity, seeking meaning and enabling children to follow their passions.

We believe depth of learning can be achieved when:

- Children form a relationship with their learning.
- The learning has human significance so it's relevant to the future decisions and the active contribution our children can make to the world; learning that teaches the children how to live and love, as well as, how to learn.
- Collaboration is at the heart of learning. Discussion, debate, respect, communication, creativity and critical thinking skills are all valuable currency in an increasing complex world.
- Deeper thinking and reflection are prominent to deeper learning. Teaching children how to reflect, explain, justify, question are key to lesson design.

Key Stage 1	Throughout each Year Working Scientifically 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:	
	<ul style="list-style-type: none"> ▪ asking simple questions and recognising that they can be answered in different ways ▪ observing closely, using simple equipment ▪ performing simple tests ▪ identifying and classifying ▪ using their observations and ideas to suggest answers to questions ▪ gathering and recording data to help in answering questions. 	
	KS1 Working Scientifically	Questions for Depth of Learning
	Observing closely, using simple equipment	<p>What do you notice?</p> <p>What might happen if you...instead of...?</p> <p>Why do you think...happened?</p>
	Performing simple tests	<p>How could you test...?</p> <p>Why did you...?</p> <p>Why wouldn't you...?</p> <p>What would happen if you...?</p>
Identifying and classifying	<p>Why did you put... in this group?</p> <p>Where would...go in your groups? Explain your thinking.</p> <p>Why wouldn't...go in this group?</p>	
Using their observations and ideas to suggest	What did you discover?	

					Who might need to use your findings?	
					Why do you think this?	
					How would you prove this idea is right?	
Year 1	Plants	Animals including humans	Everyday Materials	Seasonal Changes		
	<ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> ▪ 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 ▪ 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 	<ul style="list-style-type: none"> ▪ distinguish between an object and the material from which it is made ▪ identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock ▪ describe the simple physical properties of a variety of everyday materials ▪ compare and group together a variety of everyday materials on the basis of their 	<ul style="list-style-type: none"> ▪ observe changes across the four seasons ▪ observe and describe weather associated with the seasons and how day length varies. 		

		basic parts of the human body and say which part of the body is associated with each sense.	simple physical properties.			
Year 1 GD	<ul style="list-style-type: none"> Compare and draw varieties of common wild and garden plants and trees including deciduous and evergreen trees 	<ul style="list-style-type: none"> Compare/contrast and organise variety of common animals including fish, amphibians, reptiles, birds and mammals Compare/contrast and organise a variety of common animals that are carnivores, herbivores and omnivores Examine how basic parts of the human body support the use of our senses. 	<ul style="list-style-type: none"> Design and build using a variety of everyday materials, including wood, plastic, glass, metal, water, and rock 	<ul style="list-style-type: none"> Compare and contrast changes across the four seasons Record and chart changes in weather and how day length varies Critique and give reasons to defend why a particular season is preferred. 		
Year 2	Plants	Animals including Humans	Uses of Everyday Materials	Living Things and their Habitats		
	<ul style="list-style-type: none"> observe and 	<ul style="list-style-type: none"> notice that 	<ul style="list-style-type: none"> identify and 	<ul style="list-style-type: none"> explore and compare the 		

	<p>describe how seeds and bulbs grow into mature plants.</p> <ul style="list-style-type: none"> ▪ find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. 	<p>animals, including humans, have offspring which grow into adults</p> <ul style="list-style-type: none"> ▪ 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. 	<p>compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <ul style="list-style-type: none"> ▪ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<p>differences between things that are living, dead, and things that have never been alive</p> <ul style="list-style-type: none"> ▪ 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 		
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				different sources of food		
Year 2 GD	<ul style="list-style-type: none"> ▪ Draw a diagram to describe and show how seeds and bulbs grow into mature plants. ▪ Test and defend that plants need water, light and a suitable temperature to grow and stay healthy. 	<ul style="list-style-type: none"> ▪ Compare and discuss the similarities and differences between a variety of animals' offspring, including humans ▪ Defend the basic needs of animals, including humans, for survival (water, food and air) ▪ Plan a healthy human regimen that focuses on the importance of exercise, eating the right amounts of different types of food, and hygiene. 	<ul style="list-style-type: none"> ▪ Test and observe the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses ▪ Test and examine how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<ul style="list-style-type: none"> ▪ Evaluate the suitability of habitats for a living things. Determine if the habitats provide the basic needs of different kinds of animals and plants. ▪ Plan, design and build a model habitat which shows the plants, animals and sources of food within a simple food chain 		
Lower Key Stage 2 (Years 3 & 4)	<p>Throughout each Year Working Scientifically</p> <p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> ▪ asking relevant questions and using different types of scientific enquiries to answer them ▪ setting up simple practical enquiries, comparative and fair tests ▪ making systematic and careful observations and, where appropriate, taking accurate measurements using standard 					

units, using a range of equipment, including thermometers and data loggers

- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- 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.

Lower KS2 Working Scientifically

Questions for Depth of Learning

Gathering, recording

Classifying and presenting data in a variety of ways to help in answering questions

What would be the benefit of repeating your test results?

How could I improve my recording? (give example table)

How could I present my results in a clear way?

Would you use a pictogram, bar graph or line graph to present your ideas? Why?

Identifying differences, similarities or changes related to simple scientific ideas and processes

How would this be different if _____?

I think that Use your results to explain if I am likely to be right or not? How could I prove it?

How would your results apply to _____?

Using straightforward scientific evidence to answer questions or to support their findings.

Bob thinks... Use your results to justify if he is right or wrong.

Year 3	Plants	Animals including Humans	Rocks	Light	Forces and Magnets	
	<ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> ▪ 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 ▪ find patterns in the way that the size of shadows change. 	<ul style="list-style-type: none"> ▪ compare how things move on different surfaces ▪ notice that some forces need contact between two 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 ▪ describe magnets as having two poles 	

					<ul style="list-style-type: none"> ▪ predict whether two magnets will attract or repel each other, depending on which poles are facing. 	
Year 3 GD	<ul style="list-style-type: none"> ▪ Compare the functioning parts of different flowering plants: roots, stem/trunk, leaves and flowers ▪ Compare/Contrast 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 and organize them according to their requirements. 	<ul style="list-style-type: none"> ▪ Plan a daily healthy diet which ensures right types and amount of nutrition ▪ Compare and contrast the skeletons of humans and other animals. Examine the differences in muscles for support, protection and movement. 	<ul style="list-style-type: none"> ▪ Draw a diagram to explain how fossils are formed when things that have lived are trapped within rock ▪ Compare and contrast different soils that are made from rocks and organic matter. 	<ul style="list-style-type: none"> ▪ investigate how light is reflected from different surfaces ▪ examine how shadows are formed and changed with different light sources and different opaque objects ▪ Explain patterns in the way that the size of shadows change. 	<ul style="list-style-type: none"> ▪ test and evaluate how things move on different surfaces ▪ predict which everyday materials attract or repel magnets ▪ Create a design that makes use of a magnet 	

Year 4		Animals including Humans	States of Matter	Living Things and Their Habitats	Electricity	Sound
		<ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> ▪ 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 ▪ recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series 	<ul style="list-style-type: none"> ▪ 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

					<p>circuit</p> <ul style="list-style-type: none"> recognise some common conductors and insulators, and associate metals with being good conductors. 	<p>sound source increases.</p>
Year 4 GD		<ul style="list-style-type: none"> Draw a diagram to explain the simple functions of the basic parts of the digestive system in humans Determine which are common producers, predators and prey. 	<ul style="list-style-type: none"> Predict which materials change state when they are heated or cooled, and predict the measure or the temperature at which this happens in degrees Celsius (°C) Draw a diagram to explain the part played by evaporation and condensation in the water cycle 	<ul style="list-style-type: none"> Compare and contrast to organise living things in their local and wider environment using classification keys Defend the importance of protecting local environments to prevent change that can pose dangers to living things. 	<ul style="list-style-type: none"> Critique the energy efficiency of common appliances that run on electricity Predict whether or not a lamp will light in a variety of simple series circuits group common conductors and insulators, and associate metals with being good or poor conductors. 	<ul style="list-style-type: none"> Organise and group a variety of sounds based on how their made, vibrations and pitch Create a diagram to explain that vibrations from sounds travel through a medium to the ear and that sounds get fainter as the distance from the sound source increases.
Upper Key Stage 2 (Years 5 & 6)	<p>Throughout each Year Working Scientifically</p> <p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p>					

	<ul style="list-style-type: none"> ▪ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary ▪ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate ▪ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ▪ using test results to make predictions to set up further comparative and fair tests ▪ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ▪ identifying scientific evidence that has been used to support or refute ideas or arguments. 	
	<p>Upper KS2 Working Scientifically</p> <p>Using test results to make predictions to set up further comparative and fair tests</p>	<p>Questions for Depth of Learning</p> <p>Explain your thinking using what you already know.</p> <p>___ thinks _____ will happen. Do you agree? Explain.</p> <p>How would you improve the test to make sure your results are accurate?</p> <p>What questions have arisen from this enquiry? How would you answer/test them?</p> <p>I know/want to know _____. How could I prove this right or wrong?</p>
	<p>Identifying scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>___ thinks _____, use your results to explain whether they are right or wrong.</p> <p>How did ___ prove ___?</p> <p>Use your learning to explain...</p> <p>How could you prove.... Is right or wrong?</p>

	Is one piece of evidence enough to justify an idea? Explain your thinking.					
Year 5		Animals Including Humans	Properties and changes of materials	Living Things and Their Habitats	Forces	Earth and Space
		<ul style="list-style-type: none"> ▪ describe the changes as humans develop to old age. 	<ul style="list-style-type: none"> ▪ 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 	<ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> • 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 the sun across the sky.

			<p>decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <ul style="list-style-type: none">▪ 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▪ 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			
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			bicarbonate of soda.			
Year 5 GD		<ul style="list-style-type: none"> Use/create charts, graphs and diagrams to explain changes as humans develop to old age. 	<ul style="list-style-type: none"> Judge and critique materials on their suitability for objects on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets Predict and explain which changes of state will be reversible 	<ul style="list-style-type: none"> Compare and contrast the differences in the life cycles of a mammal, an amphibian, an insect and a bird Draw a diagram to explain the life process of reproduction in some plants and animals. 	<ul style="list-style-type: none"> Test and predict how different objects will fall towards the Earth because of the force of gravity acting between the Earth and the falling object Use a diagram to explain the effects of air resistance, water resistance and friction, that act between moving surfaces Prove that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	<ul style="list-style-type: none"> Draw a diagram or model to explain the movement of the Earth, and other planets, relative to the Sun in the solar system Create a diagram or model to explain the movement of the Moon relative to the Earth
Year 6		Animals including Humans	Light	Living Things and Their Habitats	Electricity	Evolution and Inheritance
		<ul style="list-style-type: none"> identify and 	<ul style="list-style-type: none"> recognise that 		<ul style="list-style-type: none"> associate the 	<ul style="list-style-type: none"> recognise

		<p>name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <ul style="list-style-type: none"> ▪ recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function ▪ describe the ways in which nutrients and water are transported within animals, including humans. 	<p>light appears to travel in straight lines</p> <ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> ▪ 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 <ul style="list-style-type: none"> ▪ give reasons for classifying plants and animals based on specific characteristics. 	<p>brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <ul style="list-style-type: none"> ▪ 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. 	<p>that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <ul style="list-style-type: none"> ▪ 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
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						<p>may lead to evolution.</p>
<p>Year 6 GD</p>		<ul style="list-style-type: none"> ▪ Create a diagram to name the main parts of the human circulatory system, and explain their functions ▪ Debate the impact of diet, exercise, drugs and lifestyle on the way their bodies function ▪ Organise and group the different ways in which nutrients and water are transported within animals, including humans. 	<ul style="list-style-type: none"> ▪ Justify that light travels in straight lines ▪ Draw a diagram 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 	<ul style="list-style-type: none"> ▪ Show using charts, graphs and diagrams 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 <ul style="list-style-type: none"> ▪ Apply/Examine the classification of plants and animals based on specific characteristics for a purpose 	<ul style="list-style-type: none"> ▪ Chart or graph the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit ▪ Design and diagram simple circuits using the recognised symbols 	<ul style="list-style-type: none"> ▪ Explain that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago ▪ Prove how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.