



Science Progression Map
Progression of Scientific Skills

		RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	Upper KS2 (Y5 and Y6)
QUESTION		Ask simple questions about immediate environment.	Ask questions and know some can be answered using scientific enquiry.		Identify scientific questions. ie can be investigated through scientific enquiry.		Raise scientific questions and hypothesise
SCIENTIFIC ENQUIRY	OBSERVE	Qualitative Talk about similarities and differences.	Qualitative and Simple Quantitative		Qualitative and Quantitative		Qualitative and Quantitative
	Observe change over time. Use Senses/ equipment.		Measure change over time e.g. plant growth. Select equipment	Systematic/ careful observations. Use bar charts, pictograms, tables.	Accurate measurements. Use time graphs and other graphs.	Accurate/ precise measurements, Diagrams, tables, bar and line graphs.	Take repeat readings when appropriate. Scatter graphs.
	CLASSIFY and FIND PATTERNS	Talk and Sort	Identify and Classify		Classify and Find Patterns		Classify and Find Patterns
		Use simple scientific criteria.	e.g. familiar plants, animals, materials Compare and contrast	e.g. living/ dead/ never alive; materials Compare differences	Classify animals/ materials. Link two variables e.g. <i>the closer the magnet the bigger the force.</i>	Use simple classification keys. Link two variables e.g. <i>the more cells in a circuit, the brighter the bulb.</i>	Use complex classification keys. Identify causal relationships.
	CONTROL INVESTIGATIONS: comparative and fair testing	Explore objects/ materials/ living things/ resources designed to model scientific processes.	Simple comparative tests		Comparative and fair tests		Design own comparative and fair tests
			e.g. <i>What is the best material for an umbrella?</i>	e.g. <i>What if plants do not get light and water?</i>	Predict. Fair tests e.g. <i>How does distance affect magnet strength?</i>	Predict. Language of independent and control variable.	Identify when and how to use tests. Recognise and control variables. Make predictions based on previous test results.



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	RESEARCH	Listen and respond to stories about scientific processes/ events/ objects.	Find information using given sources. e.g. animals.	Select information from a range of given sources.	Research using given sources. e.g. research different food groups and how they keep us healthy	Select information to support findings. e.g. research animals	Explore relevant information by using a wide range of secondary sources.	
							Explore how scientific ideas have developed over time.	Identify evidence that has been used to support or refute ideas.
	MODEL	Concrete context. Create drawings and models of their environment	Concrete context Draw diagrams e.g. parts of plants/ the body.	Explore and create drawings and physical models e.g. habitats.	Abstract contexts e.g. processes and phenomena such as forces/ light. Use labelled diagrams and drawings and physical models.	Abstract contexts e.g. processes and phenomena such as sound/ electricity. Create labelled diagrams and drawings and physical models.	Abstract contexts. Evaluate diagrams/ models e.g. states of matter; solar system.	Abstract contexts. Create own versions of models. e.g. circulatory system; light.
	CONCLUDE	Explain simple phenomena: How? Why?	Describe what has happened or been observed.	Explain why a simple observation occurred. Evaluate the effectiveness of observations.	Explain an observation or an event in scientific terms. Distinguish between what has been observed and why it happened. Begin to link evidence from secondary sources as well as primary. Suggest improvements.	Evaluate original hypothesis against observed evidence and reach appropriate conclusions. Identify causal relationships. Begin to identify how reliable the data is.		



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Science Progression Map
Progression of Knowledge



	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>National Curriculum</p> <p><i>Pupils should be taught:</i></p>	<p>During EYFS children learn through the characteristics of effective learning:</p> <p>Finding out and exploring - Shows an interest in technological toys with knobs or pulleys, or real objects. 7 Shows skill in making toys work by pressing parts or lifting flaps to achieve effects, such as sound, movements or new images</p> <p>Making links - Shows an interest in technological toys with knobs or pulleys, or real objects. 7 Shows skill in making toys work by pressing parts or lifting flaps to achieve effects, such as sound, movements or new images</p>	<p>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:</p> <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 	<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. 	<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 a 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 			



The Limes Primary Academy – Learning Pathways Curriculum
Science Progression Map

By the end of the year, children should be able to...							
Animals including humans	Can talk about some of the things they have observed, such as plants, animals, natural and found object (30-50)	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	Notice that animals, including humans, have offspring which grow into adults	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	describe the simple functions of the basic parts of the digestive system in humans	describe the changes as humans develop to old age.	identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
	Developing an understanding of growth, decay and changes over time (30-50)	Identify and name a variety of common animals that are carnivores, herbivores and omnivores	Describe the basic needs of animals, including humans, for survival	identify that humans and some other animals have skeletons and muscles for support, protection and movement	identify the different types of teeth in humans and their simple functions		recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
	Looks closely at similarities, differences, patterns and change (40-60)	describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene		construct and interpret a variety of food chains, identifying producers, predators and prey.		describe the ways in which nutrients and water are transported within animals, including humans
	Shows some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health. (40-60)	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense					
They make observations of animals and plants and explain why some things occur, and talk about changes (ELG)							



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Science Progression Map

Living things and their habitats	<p>Shows care and concern for living things and the environment (30-50)</p> <p>Looks closely at similarities, differences, patterns and change (40-60)</p> <p>They talk about the features of their own immediate environment and how environments might vary from one another. (ELG)</p>		<p>Explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>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</p> <p>Identify and name a variety of plants and animals in their habitats, including microhabitats</p> <p>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.</p>		<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p>	<p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p>
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The Limes Primary Academy – Learning Pathways Curriculum
Science Progression Map

<p>Plants</p>	<p>Can talk about some of the things they have observed, such as plants, animals, natural and found object (30-50)</p> <p>Developing an understanding of growth, decay and changes over time (30-50)</p> <p>Looks closely at similarities, differences, patterns and change (40-60)</p> <p>They talk about the features of their own immediate environment and how environments might vary from one another. (ELG)</p>	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees</p>	<p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>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</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>			
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The Limes Primary Academy – Learning Pathways Curriculum
Science Progression Map

Materials	<p>Beginning to be interested in and describe the texture of things (30-50)</p> <p>Uses various construction materials (30-50)</p> <p>Experiments to create different textures 40-60)</p> <p>Manipulates materials to achieve a planned effect. (40-60)</p> <p>They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. (ELG)</p>	Everyday materials <p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties</p>	Uses of everyday materials <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>	Magnets <p>Compare how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>Describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing</p>	States of matter <p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>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)</p> <p>identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	Properties and changes of materials <p>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</p> <p>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>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</p>	
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Light				<p>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 a solid object Find patterns in the way that the size of shadows change</p>			<p>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</p>
Electricity					<p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>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</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p>		<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>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</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p>



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					Recognise some common conductors and insulators, and associate metals with being good conductors		
Forces	<p>Shows an interest in technological toys with knobs or pulleys, or real objects (30-50)</p> <p>Shows skill in making toys work by pressing parts or lifting flaps to achieve effects, such as sound, movements or new images (30-50)</p>			<p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>Describe magnets as having 2 poles</p> <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing</p>		<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect</p>	



Science Progression Map

Rocks				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			
Sound	Explores and learns how sounds can be changed. (30-50) Explores the different sounds of instruments.(40-60) Children sing songs, make music and dance, and experiment with ways of changing them. (ELG)				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		



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Science Progression Map



Earth and space						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	
Evolution and inheritance	Developing an understanding of growth, decay and changes over time (30-50) Looks closely at similarities, differences, patterns and change (40-60) They make observations of animals and plants and explain why some things occur, and talk about changes (ELG)						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