



# Lydgate Junior School Curriculum Progression for Science



At Lydgate Junior School, science is for everyone and we want science to be a verb, not a noun.

## Curriculum Overview

	Year 3	Year 4	Year 5	Year 6
<b>Autumn 1</b>	Animals including humans: skeletons	Sound	Properties and changes of materials	Electricity
<b>Autumn 2</b>	Forces and magnets	States of matter	Properties and changes of materials – including changes of state and reversible/irreversible changes	Light
<b>Spring 1</b>	Light	Water cycle	Forces	Evolution and inheritance
<b>Spring 2</b>	Rocks	Habitats	Earth in space	Living things and microorganisms
<b>Summer 1</b>	Plants	Animals including humans: digestion	Plants	Animals including humans: circulatory system
<b>Summer 2</b>		Electricity	Life cycles	

## Key Skills Progression - Working Scientifically

	Year 3	Year 4	Year 5	Year 6
<b>Working Scientifically</b>	Raise their own relevant questions about the world around them.		Use their science experiences to explore ideas and raise different kinds of questions.	
	Should be given a range of scientific experiences including different types of science enquiries to answer questions.		Talk about how scientific ideas have developed over time.	
	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions.		Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions.	
	Set up simple practical enquiries, comparative and fair tests. Recognise when a simple fair test is necessary and help to decide how to set it up.		Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.	
	Talk about criteria for grouping, sorting and classifying and use simple keys.		Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.	
	Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.		Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.	
	Make systematic and careful observations. Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.		Make their own decisions about what observations to make, what measurements to use and how long to make them for.	
	Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them.		Look for different causal relationships in their data and identify evidence that refutes or supports their ideas.	
	Take accurate measurements using standard units. Learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately.		Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate.	
	Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data.		Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	
	With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions.		Identify scientific evidence that has been used to support or refute ideas or arguments.	
	Use relevant simple scientific language to discuss ideas and communicate findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions.		Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas, use oral and written forms such as displays and other presentations to report conclusions, causal relationships and explanations of degree of trust in results.	
	With support, identify new questions arising from the data, making predictions for new values within or beyond the data collected and finding ways of improving what has already been done.		Use results to make predictions and identify when further observations, comparative and fair tests might be needed.	

## Knowledge Progression - Biology

	Year 3	Year 4	Year 5	Year 6
<b>Plants</b>	<p>Identify and describe the functions of different parts of the flowering plant: roots, stem/trunk/leaves and flowers.</p> <p>Explore the part flowers play in a flowering plants life cycle, including pollination, seed formation and seed dispersal.</p> <p>Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants.</p> <p>Know the way in which water is transported between plants.</p>		<p>Describe the life process of reproduction in some plants (and animals, including humans).</p> <p>Observe the life-cycle changes in plants.</p> <p>Find out about different types of reproduction, including sexual and asexual reproduction in plants.</p>	<p>Recognise that living things have changed over time and that fossils provide information about living things.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways, and that adaptation can lead to evolution.</p>
<b>Living things and their habitats</b>		<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 danger to living things.</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 micro habitats.</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>Know the life cycle of different living things, e.g. Mammal, amphibian, insect, bird.</p> <p>Know the process of reproduction in plants.</p> <p>Know the process of reproduction in animals.</p>	<p>Classify living things 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>

	Year 3	Year 4	Year 5	Year 6
<b>Evolution and inheritance</b>	<p>Understand there is a variety of life on Earth.</p> <p>Know how animals and plants reproduce.</p> <p>Know how fossils form over time.</p>	<p>Know that some animal's differences are important to their survival.</p>	<p>Know how animals and plants reproduce.</p>	<p>Know about evolution and can explain what it is.</p> <p>Know how fossils can be used to find out about the past.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p>

## Knowledge Progression - Chemistry

	Year 3	Year 4	Year 5	Year 6
<b>Materials</b>		<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>	<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>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</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>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</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>	
<b>The Earth : rocks and atmosphere</b>	<p>Recognise that that soils are made from rocks and organic matter.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Compare and group together different kinds of rocks on the basis of their simple physical properties.</p>			

## Knowledge Progression - Physics

	Year 3	Year 4	Year 5	Year 6
<b>Motion and forces</b>	<p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Compare how things move on different surfaces.</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, which act between moving surfaces.</p> <p>Recognise that some mechanisms, including gears, pulleys, levers and springs, allow a smaller force to have a greater effect.</p>	
<b>Waves (light)</b>	<p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>Find patterns in the way that the size of shadows change.</p>			<p>Recognise that light appears to travel in straight lines.</p> <p>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.</p> <p>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.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>

	Year 3	Year 4	Year 5	Year 6
<b>Waves (sound)</b>		<p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>		
<b>Magnetism</b>	<p>Notice that some forces need contact between two objects and some forces act at a distance.</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>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>			

	Year 3	Year 4	Year 5	Year 6
<b>Electricity</b>		<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>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>		<p>Use recognised symbols when representing a simple circuit in a diagram.</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>
<b>Energy</b>			<p>Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs.</p>	
<b>Earth and space</b>			<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Describe the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>	