

'A CURRICULUM TO INSPIRE'

What Make a Good Mountfields Lodge Scientist?

- **Independently** ask questions to **Explore** the World around us.
- Have the confidence in using a wide range of practical skills.
- Become **independent** in planning and carrying out scientific investigations in a variety of contexts.
- **Communicate** scientific findings, knowledge and understanding in a range of written and verbal ways.
- **Persevere** in solving challenging problems through use of originality, imagination and innovation.
- Have a passion for Science and appreciate how Science helps us to understand our World and the impact it has on our past, present and future.

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Progression Map for Science – How to be a Scientist

Y1/2	Y3/4	Y5/6
Explore the world around them and raise their own simple questions	Raise their own relevant questions to explore the world around them	Independently use their science experiences to explore ideas and raise different kinds of questions
Know that scientists have discovered things about the world around us.	Talk about how scientific ideas have helped us to understand the world around us	talk about how scientific ideas have helped us to understand the world around us and how science is used today and in the future
Begin to recognise different ways in which they might answer scientific questions - <i>e.g. sorting, comparing, measuring, observing, testing</i>	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions <i>e.g. comparing, classifying, measuring, observing, fair testing, research</i>	Independently select and plan the most appropriate type of scientific enquiry to use to answer scientific questions <i>e.g. comparing, classifying, measuring, observing, fair testing, research</i>
With support, carry out simple tests to answer questions	Set up simple practical enquiries, comparative and fair tests to answer questions	With increasing independence , recognise when and how to set up comparative and fair tests by <ul style="list-style-type: none"> • Explaining which variables need to be controlled and why • Making their own decisions about what observations to make, what measurements to use and how long to make them for • Making their own predictions based on scientific knowledge • Choose the most appropriate equipment to make measurements
Make simple predictions and say whether what happened was what they expected	Recognise when a simple fair test is necessary and with some guidance decide how to set it up by: <ul style="list-style-type: none"> • Helping to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used • Making predictions based on own experience and existing knowledge • Deciding what data to collect to test these predictions. 	
Ask people questions and use simple secondary sources to find answers	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
Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and sorting)	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

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Y1/2	Y3/4	Y5/6
Observe closely using simple equipment With help, observe changes over time	Make systematic and careful observations	Make systematic and detailed observations of changes they notice, and record these in notes or diagrams.
Make simple measurements and equipment (<i>e.g. hand lenses, egg timers, metre sticks</i>) to gather data (<i>mainly non-standard units</i>)	Take accurate measurements using standard units. Learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately.	Measure with increasing precision and explain how to use equipment accurately. Take repeat measurements where appropriate.
With guidance, they should compare and begin to notice patterns and relationships from data collected (<i>e.g. from bar charts say which is biggest/smallest</i>)	With help, pupils should look for changes, patterns, similarities and differences in their data and observations in order to draw simple conclusions and answer questions.	Look for different relationships and patterns, based on cause and effect, in the data they have collected. Use this evidence to justify their scientific ideas and question those of others.
Use their observations and ideas to suggest answers to questions Talk about what they have found out and how they found it out	Use relevant simple scientific language to discuss their ideas and communicate their 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 their 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 help, they should record and communicate their findings in a range of ways and begin to use simple scientific language – <i>e.g. diagrams, posters, photographs of changes, displays, captions, simple sentences.</i>	With support, they should use their results to make further predictions from their data and identify new questions. Find ways of improving what they have already done.	Use their results to make predictions within and beyond the data collected and identify when further observations, comparative and fair tests might be needed. Explain how much they trust their results and what could be done to improve the accuracy of their observations or testing.

NB Pupils are not expected to cover each aspect for every area of study. Judgements should be made on which learning objectives are appropriate for which theme, with a balance across the 2 year cycle. "How to be a Scientist" skills should be explicitly taught alongside the knowledge and understanding of the subject.

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Progression Map for Science – Biology

Aspect	Y1/2	Y3/4	Y5/6
Plants	Identify and name a variety of common plants, including garden plants, wild plants and trees, found in our grounds, and those classified as deciduous and evergreen.	Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers, seeds/reproduction.	Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
	Identify and describe the basic structure of a variety of common flowering plants, including 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.	Compare the life process of reproduction amongst plants and animals.
	Observe and describe how seeds and bulbs grow into mature plants.	Investigate the way in which water is transported within plants.	
	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. <i>(Throughout the year/over time. Linked to DT and growing own food).</i>		
	Observe and describe changes in the weather, day length and plants across the four seasons within our local environment.		

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Aspect	Y1/2	Y3/4	Y5/6
Humans and Animals	Identify and name a variety of common animals from across these groups: birds, fish, amphibians, reptiles, mammals and invertebrates. <i>(Not necessary to use group names in KS1)</i>	Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat.	Identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels, blood pressure and blood (including the pulse and clotting).
	Identify and name a variety of common animals that are carnivores, herbivores and omnivores.	Describe the ways in which nutrients and water are transported within animals, including humans.	Identify and name the main parts of the gaseous exchange system: lungs, nose, throat, bronchi, bronchial tubes, diaphragm, ribs and breathing.
	Describe and compare the body features of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, incl. pets).	Identify that humans and some animals have skeletons and muscles for support, protection and movement.	Recognise the impact of diet, exercise, drugs and lifestyle on the way human bodies function.
	Identify name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Describe the simple functions of the basic parts of the digestive system in humans.	
	Notice that animals, including humans, have offspring which grow into adults.	Identify the different types of teeth in humans and their simple functions.	
Investigate 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.			
Explore and compare the differences between things that are living, that are dead and that have never been alive.			



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Aspect	Y1/2	Y3/4	Y5/6
To investigate living things.	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 living things (plants and animals) in the local and wider environment, using classification keys to assign them to groups, e.g. birds, fish, amphibians, reptiles, mammals and invertebrates. (At this stage terminology can be introduced.	Describe the life cycles common to a variety of animals, including humans (birth, growth, development, reproduction, death), and to a variety of plants (growth, reproduction and death).
	Describe how animals obtain their food from plants and animals using a simple food chain.	Give reasons for classifying plants and animals based on specific characteristics and structure (<i>and how they are suited to their environments</i>).	Explain the classification of living things into broad groups according to common, observable characteristics and based on similarities and differences, including plants, animals and micro-organisms.
		Recognise that environments are constantly changing and that this can sometimes pose dangers to specific habitats.	Describe the life process of reproduction in some plants and animals, <i>include puberty and sex education</i> .
		Explain, using food chains and simple food webs, how feeding relationships occur in the local environment, including a variety of habitats. (<i>Use terminology – predator, prey, consumer and producer</i>).	Describe how plants and animals, including humans, resemble their parents in many features. Recognise and give reasons why living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents (<i>plants and animals</i>). Recognise how animals and plants are suited to and adapt to their environments, and how this leads to evolution through changes over time.



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Progression Map for Science - Chemistry

Aspect	Y1/2	Y3/4	Y5/6
To investigate materials	Distinguish between an object and the material from which it is made.	Compare and group materials together, according to whether they are solids, liquids or gases.	Understand how some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.
	Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, rock, brick, paper and cardboard; use simple testing to compare their uses and suitability for purpose.	Compare and group together materials based on their insulation properties.	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
	Describe the simple physical properties of a variety of everyday materials.	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Measure the temperature at which this happens in degrees Celsius (0 °C and 100 °C).	Demonstrate that dissolving, mixing and changes of state are reversible changes.
	Observe that some materials change state when they are heated or cooled.		
	Recognise that some changes can be reversed.		
	Compare and group together a variety of everyday materials on the basis of their simple physical properties.		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, oxidation and the action of acid on bicarbonate of soda.
	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		

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Aspect	Y1/2	Y3/4	Y5/6
Rocks		Compare and group together different kinds of rocks on the basis of their simple, physical properties.	
		Relate the simple physical properties of some rocks to their formation (igneous or sedimentary).	
		Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock.	
		Explain that fossils provide information about living things that inhabited the Earth many years ago.	

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Progression Map for Science - Physics

Aspect	Y1/2	Y3/4	Y5/6
Sound	Observe and name a variety of sources of sound, noticing that we hear with our ears.		Identify how sounds are made, associating some of them with something vibrating.
			Recognise vibrations travel through a medium to the ear.
			Recognise that sounds get fainter as the distance from the sound's source increases.
			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.
Light	Identify and name a variety of sources of light. Explain that darkness is the absence of light. Describe the features of day and night, including changes in light and temperature.	Recognise that light is reflected from surfaces. Compare everyday materials based on transparency using terms opaque, translucent and transparent. Explain how shadows are made when a light source is blocked by something that is not transparent. Understand that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain why shadows have the same shape as the object that cast them. Predict and investigate the size of shadows in relation to proximity to the light source. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.	Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyes.

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Aspect	Y1/2	Y3/4	Y5/6
Electricity	Identify common appliances that run on electricity, battery/mains toys.	Construct a simple series electrical circuit.	Teach objectives in context of DT topic.
		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.	Identify and name the basic parts of a simple electrical circuit, including cells, wires, bulbs, switches and buzzers.
		Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

