Meldreth Primary Progression in Science

Scientific Disciplinary Knowledge & Prior Learning

EYFS (Development Matters): Explore the natural world around them. Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them.

KS1 (National Curriculum): pupils should be taught the following scientific methods, processes and skills: 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

KS2 (National Curriculum): pupils should be taught the following scientific methods, processes and skills: 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

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Questioning	Ask simple questions about the world around them.	Ask questions and know some can be answered using scientific enquiry.	To explain that questions can be answered in different ways.	To use straightforward scientific evidence to answer questions or to support their findings.	To report on findings from an enquiry.	Raise scientific questions and hypothesise.	Plan an enquiry that will answer a question.
Observing	Make observations and pictures. Talk about similarities and differences.	Observe changes over time.	Measure and observe changes over time.	Make systematic and careful observations using appropriate equipment.	Make accurate, systematic and careful observations using appropriate equipment.	Take accurate and precise measurements.	Take accurate and precise measurements taking repeat readings when appropriate.
Classifying	Explore objects around them.	Group familiar objects.	Group and compare familiar objects	Classify familiar objects.	Use simple classification keys to classify familiar objects.	Use complex classification keys, identifying causal relationships.	Create classification keys, identifying evidence to support or disprove causal relationships.
Investigating		Carry out simple class comparative tests with support.	Carry out simple group comparative tests.	Carry out comparative tests that include making a prediction.	Carry out comparative tests that include making a prediction and controlling independent variables.	Design and carry out comparative and fair tests that include making predictions, controlling variables and results.	Design and carry out comparative and fair tests that include making predictions, controlling variables and asking further questions based on results.
Researching	Listen to stories with Science links and discuss what they hear	Find information from given simple sources.	Find and select information from given simple sources.	Research relevant information from a range of sources.	Research relevant information and select from a range of sources.	Explore how scientific evidence has changed over time.	Identify evidence that supports or disproves an idea.
Recording	Draw pictures.	Draw simple diagrams.	Draw simple diagrams and create scientific models.	Use labelled diagrams and scientific models. Use keys, bar charts and tables.	Create labelled diagrams and scientific models. Use keys, bar charts and tables.	Evaluate diagrams and models. Use tables, scatter, bar and line graphs.	Create and evaluate diagrams and models. Use tables, scatter, bar and line graphs.
Concluding	Explain simple 'why' and 'how' questions.	Describe what has been observed.	Describe what has been observed and explain why.	Explain observations using scientific vocabulary and explain why.		Evaluate predictions against results, using scientific vocabulary, and begin to identity causal relationships. Begin to discuss reliability of data	

Deeper Thinking EYFS/KS1:	Deeper Thinking KS2:
• Can suggest ways of finding out through listening, hearing, smelling, touching and tasting • Say whether things happened as they expected and if not why not Can independently consider controlling variables to make a fair test • Can explain what they have found out using scientific vocabulary • Can they make accurate measurements using nonstandard measurements i.e. multilink	• Can observe and ask questions based on own observations before suggestion an area to test further • Can choose the best way to answer a question and use information from different sources to plan an investigation Can make a prediction which links with other scientific knowledge • Can use test results to make further predictions and set up further comparative tests • Can explain how they could improve their way of working Can report and present 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 • Can report findings from investigations through written explanations and conclusions

Scientific Substantive Knowledge & Prior Learning

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants						
Explore the world around them by observing plants.	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.	To observe and know how seeds and bulbs grow into mature plants. To find out and describe how plants need water, light and suitable temperature to grow and stay healthy.	Identify, know and describe the functions of different parts of flowering plants: roots, stem/truck, leaves and flowers. Explore and know 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 and understand 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.			
Animals, including Humans						
Explore the world around them by observing animals.	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).	To know that animals, including humans, have offspring which grow into adults. To know and describe the basic needs of animals, including humans, for survival (water, food and air). To know and describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	To identify and know 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 and know that humans and some animals have skeletons and muscles for support, protection and movement.	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.	To 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. 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. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
Living Things and their Habitats						

Notice similarities and differences in the world around them.		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 microhabitats. 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.		Identify and name a variety of living things (plants and animals) in the local and wider environment. Give reasons for classifying plants and animals based on specific characteristics. Recognise that environments are constantly changing and that this can sometimes pose dangers to specific habitats.	To know and describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	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. Give reasons for classifying plants and animals based on specific characteristics.
Evolution and Inheritance						
						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.
Everyday Materials						
Name some materials in their environment.	To know how to distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Identify, compare and know the uses of a variety of				

	wood, plastic, glass, metal, water, and rock. To be able to describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials based on their simple physical properties.	everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard.				
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 soil is made from rocks and organic matter.				
Properties and Changes in Materials						
Notice properties of everyday materials, e.g. waterproof, floats/ sinks.				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 the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	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, 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.	
Seasonal Changes						
Understand changes in the seasons through observations.	Observe and talk about changes across the four seasons . Observe and describe weather associated with the seasons and how day length varies, including understanding that it is unsafe to look directly at the Sun.					
Sound and Hearing						
				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 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's source increases.		
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.	
Light						
			Recognise that they need light in order to see things and that dark is 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 the eyes. Recognise that shadows are formed when light from a light source is blocked by a solid object. Find patterns in the way that the size of shadows changes			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.
Electricity						
				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 circuit.		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, 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.

				Recognise some common conductors and insulators and associate metals with being good conductors.		
Forces and Magnets						
			Compare how things move on different surfaces. Notice that some forces need contact between 2 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 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.		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	

Misconceptions:

- https://pstt.org.uk/resources/common-misconceptions/