Middlezoy & Othery Schools

Progression Map for Science

Intent:

Our curriculum ensures that our Scientists have:

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings
- High levels of originality, imagination or innovation in the application of skills
- The ability to undertake practical work in a variety of contexts, including fieldwork
- A passion for science and its application in past, present and future technologies.
- An understanding of how science learning can support future career choices.

As we have mixed age classes, our curriculum for science runs on a 2-year rolling cycle.
The National curriculum for each key stage will be taught by the end of that key stage.

Implementation						
EYFS	**KS1**		**KS2**			
Year R	Year 1 and 2		Lower KS2		Upper KS2	
Animals including Humans						
Explore the natural world around them, making observations and drawing pictures of animals and plants.	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 basic parts of the human body and say which part of the body is associated with each sense.	Notice that animals, including humans, have offspring which grow into adults. 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.	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.	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.	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.
Plants						
Explore the natural world around them, making observations	Identify and name a variety of common wild and garden	Observe and describe how seeds and bulbs	Identify and describe the functions of different parts of flowering plants:			

and drawing pictures of animals and plants.	plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.	grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	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.			
Living things and their habitats						
Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.		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		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	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.	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. Give reasons for classifying plants and animals based on specific characteristics.

		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.		sometimes pose dangers to living things.		
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.
Seasonal Changes						
Understand some important processes and changes in the natural world around them, including the seasons.	Observe changes across the 4 seasons. Observe and describe weather associated with the seasons and how day length varies.					
Forces						
			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.		***Forces*** 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.	

			Describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.			
Light						
			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.			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.
Sound						
				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.		
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.	
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. Recognise some common conductors and insulators, and associate metals with being good conductors.		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.

Materials						
ELG Understand some important processes and changes in the natural world around them, including changing states of matter.	***Everyday Materials*** 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 simple physical properties.	***Uses of Everyday Materials*** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	***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.	***States of Matter*** 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.	***Properties and Changes of Materials*** 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.	

Working Scientifically				
	EYFS	**KS1**	**LKS2**	**UKS2**
Asking questions and carrying out fair and comparative tests	Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another.	Asking simple questions and recognising that they can be answered in different ways. Performing simple tests. *Children can:* a) explore the world around them, leading them to ask some simple scientific questions about how and why b) things happen; c) begin to recognise ways in which they might answer scientific questions; d) ask people questions and use simple secondary sources to find answers; e) carry out simple practical tests, using simple equipment; f) experience different types of scientific enquiries, including practical activities; g) talk about the aim of scientific tests they are working on.	Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. *Children can:* a) start to raise their own relevant questions about the world around them in response to a range of scientific experiences; b) start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; c) recognise when a fair test is necessary; d) help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used; e) set up and carry out simple comparative and fair tests. a	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Using test results to make predictions to set up further comparative and fair tests. *Children can:* a) with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; b) with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; c) explore and talk about their ideas, raising different kinds of scientific questions; d) ask their own questions about scientific phenomena; e) select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; f) make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; g) plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary; h) use their test results to identify when further tests and observations may be needed; i) use test results to make predictions for further tests.

Observing and measuring changes	They make observations of animals and plants and explain why some things occur and talk about changes.	Observing closely, using simple equipment. *Children can:* a) observe the natural and humanly constructed world around them; b) observe changes over time; c) use simple measurements and equipment; d) make careful observations, sometimes using equipment to help them observe carefully.	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. *Children can:* a) make systematic and careful observations; b) observe changes over time; c) use a range of equipment, including thermometers and data loggers; d) ask their own questions about what they observe; e) where appropriate, take accurate measurements using standard units using a range of equipment.	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. *Children can:* a) choose the most appropriate equipment to make measurements and explain how to use it accurately; b) take measurements using a range of scientific equipment with increasing accuracy and precision; c) make careful and focused observations; d) know the importance of taking repeat readings and take repeat readings where appropriate.
Identifying, Classifying, Recording and Presenting Data		Identifying and classifying. Gathering and recording data to help in answering questions. *Children can:* a) use simple features to compare objects, materials and living things; b) decide how to sort and classify objects into simple groups with some help; c) record and communicate findings in a range of ways with support; d) sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables.	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. *Children can:* a) talk about criteria for grouping, sorting and classifying; b) group and classify things; c) collect data from their own observations and measurements; d) present data in a variety of ways to help in answering questions; e) use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; f) record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. *Children can:* a) independently group, classify and describe living things and materials; b) use and develop keys and other information records to identify, classify and describe living things and materials; c) decide how to record data from a choice of familiar approaches; d) record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.

Drawing conclusions, Noticing patterns and Presenting findings		Using their observations and ideas to suggest answers to questions. *Children can:* a) notice links between cause and effect with support; b) begin to notice patterns and relationships with support; c) begin to draw simple conclusions; d) identify and discuss differences between their results; e) use simple and scientific language; f) read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; g) talk about their findings to a variety of audiences in a variety of ways.	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. *Children can:* a) draw simple conclusions from their results; b) make predictions; c) suggest improvements to investigations; d) raise further questions which could be investigated; e) first talk about, and then go on to write about, what they have found out; f) report and present their results and conclusions to others in written and oral forms with increasing confidence.	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. *Children can:* a) notice patterns; b) draw conclusions based in their data and observations; c) use their scientific knowledge and understanding to explain their findings; d) read, spell and pronounce scientific vocabulary correctly; e) identify patterns that might be found in the natural environment; f) look for different causal relationships in their data; g) discuss the degree of trust they can have in a set of results; h) independently report and present their conclusions to others in oral and written forms.
Using scientific evidence and secondary sources of information			Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings. *Children can:* a) make links between their own science results and other scientific evidence; b) use straightforward scientific evidence to answer questions or support their findings; c) identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; d) recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	Identifying scientific evidence that has been used to support or refute ideas or arguments. *Children can:* a) use primary and secondary sources evidence to justify ideas; b) identify evidence that refutes or supports their ideas; c) recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; d) use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; e) talk about how scientific ideas have developed over time.

Impact						
EYFS	**KS1**		**KS2**			
Year R			Lower KS2 Years 3 and 4		Upper KS2 Years 5 and 6	
Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.	Children should be able to name, label and sort animals, plants and body parts into groups. They should be able to perform simple tests, gather data and discuss what they find out.	Children should be able to experience and observe phenomena, looking more closely at world around them. They should be curious and ask questions about what they notice. They should be developing their scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things and carrying out simple tests.	Children should be able to label the parts of a plant and have a secure knowledge of what a plant needs to survive. Undertake observations over a period of time, make predictions, present data and analyse findings. Explain how water transportation occurs. Children should be able to confidently compare and group together different kinds of rocks & fossils based on their appearance and physical features. To sort, name and identify magnetic and nonmagnetic objects. To understand light & shadows, patterns and reflection.	Children should be able to explain how sound is made up of vibrations. Children have an understanding of different materials and their state of matter. Children have a deeper understanding of animals within their habitat and a food chain. Children should be able to scientific vocabulary to plan, carry out their own investigations.	Children use their knowledge of the solar system to explain regularly experienced natural processes such as day and night and gravity. They can explain similarities and differences between the life cycles of plants, animals and humans using appropriate scientific vocabulary.	Children use their scientific skills and vocabulary to plan, carry out and evaluate appropriate investigations to explore the wider world.