Maryland Science progression map

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key working scientifically skills developing through Year 1 & 2: - develop their understanding of scientific ideas - using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests - Finding things out using secondary sources of information. - Begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. - Use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.						
Year 1	**Topic: Animals Inc. Humans** 1.Life exists in a variety of forms and goes through a cycle **Specific knowledge** 1.identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals 2. identify and name a variety of common animals that are carnivores, herbivores and omnivores 3. describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) 4.identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. **Specific 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 gathering and recording data to help in answering questions. Specific skills: - using their observations to compare and contrast animals at first hand or through videos and photographs - describing how they identify and group them; grouping animals according to what they eat - using their senses to compare different textures, sounds and smells.		**Topic: Everyday materials** 1. The physical properties of materials determine their uses. **Specific knowledge:** 1.distinguish between an object and the material from which it is made 2. identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock 3.describe the simple physical properties of a variety of everyday materials 4. compare and group together a variety of everyday materials on the basis of their simple physical properties. **Specific skills**: - performing simple tests to explore questions -identifying and classifying -observe closely and use equipment	**Topic: Seasonal changes (carried out throughout the year)** 1. Day, night, month, seasonal change & year are caused by the position and movement of the Earth **Specific knowledge:** observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies. **Specific skills:** - making tables and charts about the weather; - making displays of what happens in the world around them including day length, as the seasons change - performing simple tests to explore questions -Identifying and classifying	**Topic: Plants** 1. Habitats provide living things with what they need. 2. Life exists in a variety of forms and goes through a cycle **Specific knowledge** 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. **Specific skills:** - observing closely, perhaps using magnifying glasses - comparing and contrasting familiar plants - describing how they were able to identify and group them - drawing diagrams showing the parts of different plants including trees. - keep records of how plants have changed over time - compare and contrast what they have found out about different plants.	

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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2	**Living Things and their Habitats** NC big ideas: 1. Habitat provide living things with what they need **Specific knowledge;** - 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. **Specific skills**: - sorting and classifying things according to whether they are living, dead or were never alive, - recording their findings using charts . - describe how they decided where to place things - exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. - construct a simple food chain that includes humans (e.g. grass, cow, human). - describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.		**Topic: Animals Inc. Humans** NC big ideas: The human body has a number of systems, each with its own function **Specific knowledge;** -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. **Specific skills:** - observing, through video or first-hand observation and measurement, how different animals, including humans - grow asking questions about what things animals need for survival - what humans need to stay healthy - suggesting ways to find answers to their questions.	**Topic: Use of every day materials** NC big ideas: 1. The physical properties of materials determine their uses. 2. The physical properties of materials determine their uses. **Specific knowledge:** 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 **Specific skills:** comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs) - observing closely, identifying and classifying the uses of different materials - recording their observations.	**Topic: Plants** NC big ideas: 1. Habitats provide living things with what they need 2. Life exists in a variety of forms and goes through a cycle **Specific knowledge:** - observe and describe how seeds and bulbs grow into mature plants - find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. **Specific skills:** - observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth - setting up a comparative test to show that plants need light and water to stay healthy.	

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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	Key working scientifically skills developing through Year 3 & 4: - 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.					
	Topic: Forces & Magnets **NC big ideas:** 1. There are contact and non-contact forces; these affect the motion of objects. **Specific knowledge** compare how things -move on different surfaces -notice that some forces need contact between two 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 two poles -predict whether two magnets will attract or repel each other, depending on which poles are facing. **Specific skills: -** comparing how different things move and grouping them - raising questions and carrying out tests to find out how far things move on different surfaces - gathering and recording data to find answers their questions - exploring the strengths of different magnets and finding a fair way to compare them	**Topic: Rocks & Soils** **NC big ideas:** 1. Different rocks have different properties, soil & fossils are formed. **Specific knowledge -**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. **Specific skills**: - observing rocks - exploring how and why they might have changed over time - using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. - research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. - explore different soils and identify similarities and differences - raise and answer questions about the way soils are formed.	**Topic Light & Shadow** **NC big ideas:** 1. Light & sound can be reflected & absorbed; they enable us to see & hear **Specific knowledge** **-**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. **Specific skills:** - looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.	**Topic: Plants** **NC big ideas:** 1. Habitats provide living things with what they need. 2. Life exists in a variety of forms and goes through a cycle **Specific knowledge** -identify and describe the functions of different parts of flowering plants: 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. **Specific skills:** - comparing the effect of different factors on plant growth, - discovering how seeds are formed by observing the different stages of plant life cycles over a period of time	**Topic: Animals inc. humans** **NC big ideas:** 1. The human body has a number of systems, each with its own function **Specific knowledge** - 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. **Specific skills**: - identifying and grouping animals with and without skeletons - observing and comparing their movement - exploring ideas about what would happen if humans did not have skeletons. - compare and contrast the diets of different animals - research different food groups and how they keep us healthy and design meals based on what they find out.

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	- sorting materials into those that are magnetic and those that are not - looking for patterns behave in relation to each other - identifying how these properties make magnets useful in everyday items.				
Year 4	**Topic: Electricity** **NC big ideas:** **1.** Electricity can make circuits work and can be controlled to perform useful functions **Specific knowledge** 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.	**Topic: Animals inc. Humans** **NC big ideas:** **1.** The human body has a number of systems, each with its own function **Specific knowledge** -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. **Specific skills:** - comparing the teeth of carnivores and herbivores - suggesting reasons for differences - finding out what damages teeth and how to look after them. - discuss their ideas about the digestive system.	**Topic: States of matter** **NC big ideas:** 1. Materials can exist in different states; these states can sometimes be changed **Specific knowledge** -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. **Specific skills:** - grouping and classifying a variety of different materials - exploring the effect of temperature on substances - research the temperature at which materials change state - observe and record evaporation over a period of time - investigate the effect of temperature on washing drying or snowmen melting.	**Topic: Sound** **NC big ideas:** **1.** Light & sound can be reflected & absorbed; they enable us to see & hear **Specific knowledge** -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. **Specific skills:** - finding patterns in the sounds that are made by different objects - make earmuffs from a variety of different materials to investigate which provides the best insulation against sound	**Topic: Living things & their habitat** **NC big ideas:** 1. Living things can be classified according to observable features 2. Habitats provide living things with what they need Specific knowledge **Specific knowledge** -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 sometimes pose dangers to living things. **Specific skills:** - using and making simple guides or keys to explore and identify local plants and animals - making a guide to local living things - raising and answering questions based on their observations.
UKS2	Key working scientifically skills developing through UKS2 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:				

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	- 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 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				
Year 5	**Topic: Animals inc. humans** **NC big idea:** 1. describe the changes as humans develop to old age. **Specific knowledge:** Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. **Specific skills:** - researching the gestation periods of other animals - comparing them with humans; by finding out and recording the length and mass of a baby as it grows.	**Topic: Earth & space** **NC big ideas:** 1. Day, night, month, seasonal change & year are caused by the position and movement of the Earth **Specific knowledge** 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. **Specific skills:** - find out about the way that ideas about the solar system have developed, - understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists	**Topic: Forces** **NC big ideas:** 1. There are contact and non-contact forces; these affect the motion of objects. **Specific knowledge** -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. **Specific skills:** - explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. - should experience forces that make things begin to move, get faster or slow down. - explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. - explore the effects of levers,	**Topic: Properties and changes of materials** **NC big ideas:** The physical properties of materials determine their uses. **Specific knowledge** -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	**Topic: Living things & their habitats** **NC big ideas: 1.** Life exists in a variety of forms and goes through a cycle. 2. The human body has a number of systems, each with its own function **Specific knowledge** 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 **Specific skills:** - observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times) - asking pertinent questions and suggesting reasons for similarities and differences - grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. - observe changes in an animal over a period of time (for example, by hatching and rearing chicks), -comparing how different animals reproduce and grow.

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			pulleys	usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. **Specific skills:** -explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognizing that melting and dissolving are different processes. - explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda	
Year 6	**Topic: Animals inc. Humans'** **NC big ideas:** 1. The human body has a number of systems, each with its own function **Specific knowledge** -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. **Specific skills:** - to explore and answer questions that help them to understand how the circulatory system enables the body to function. - learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body	**Topic: Light** **Specific knowledge** -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. **Specific skills**: - exploring the way that light behaves, including light sources, reflection and shadows. - talk about what happens and make predictions.	**Topic: Electricity** **NC big ideas:** Electricity can make circuits work and can be controlled to perform useful functions **Specific knowledge** 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	**Topic: Evolution & inheritance** **NC big ideas:** **1.** Living things can be classified according to observable features 2. Variation and adaptation in living things may lead to evolution. **Specific knowledge** 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 **Specific skills: -** Explore the idea that characteristics are passed from parents to their offspring appreciate that variation in offspring over time can make animals more or less able to survive in particular environment - find out about the work of palaeontologists such as Charles Darwin how they developed their ideas on evolution.	