Science Progression Map - Substantive Knowledge

Please refer to the individual learning blocks for key vocabulary.

Year Group	Biology				
	Plants	Living things in their habitat	Seasonal Changes	Animals including humans	Evolution and Inheritance
EYFS (Nursery)	I know the names of the basic parts of a plant and a tree. I know about the life cycle of a plant. I know how to care for plants.	I can observe growth and decay over time. I can begin to understand the need to respect and care for the natural environment and living things. I can explore different outdoor habitats. I can name a range of animals and plants.	I know about different seasons and the effect they have on plants, trees and wildlife.	I can name and identify basic body parts and their function. I can observe the effect of physical activity. I know that sleep, food, hygiene are important for our health. I know how humans develop from babies. I can name animal babies. I understand the key features of the butterfly life cycle.	
EYFS (Reception)	I can name a variety of common wild and garden plants. I can observe and know how to care for growing plants.	I can identify plants and animals living in contrasting environments. I know how to care for the natural environment and living things	I can talk about changes observed in the different seasons.	I can talk about the human life cycle recognising there are different stages. I can compare and group dinosaurs, naming different body parts. I can identify and name farm animals. I can name a variety of sea creatures.	

				I can observe caterpillars becoming butterflies. I can name some of the human senses.	
Year 1	I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. I can identify and describe the basic structure of a variety of common flowering plants, including trees.		I can observe changes across the four seasons. I can observe and describe weather associated with the seasons and how day length varies.	I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. I can identify and name a variety of common animals that are carnivores, herbivores and omnivores. I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	
Year 2	I can observe and describe how seeds and bulbs grow into mature plants. I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	I can explore and compare the differences between things that are living, dead, and things that have never been alive. I can 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		I can notice that animals, including humans, have offspring which grow into adults. I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air).	

		animals and plants, and how they depend on each other. I can identify and name a variety of plants and animals in their habitats, including microhabitats. I can 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.		I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	
Year 3	I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. I can 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. I can investigate the way in which water is transported within plants. I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			I can 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. I can identify that humans and some other animals have skeletons and muscles for support, protection and movement.	
Year 4		I can recognise that living things can be grouped in a variety of ways.		I can describe the simple functions of the basic parts of the digestive system in humans.	

		I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. I recognise that environments can change and that this can sometimes pose dangers to living things.		I can identify the different types of teeth in humans and their simple functions. I can construct and interpret a variety of food chains, identifying producers, predators and prey.	
Year 5		I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. I can describe the life process of reproduction in some plants and animals.		I can describe the changes as humans develop to old age.	
Year 6		I can 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. I can give reasons for classifying plants and animals based on specific characteristics.		I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. I can describe the ways in which nutrients and water are transported within animals, including humans.	I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Year Group	Chemistry	
	Materials	Rocks
EYFS (Nursery)	I can name a variety of materials and begin to describe their properties, e.g. float/sink, cause shadows.	
EYFS (F2)	I can name a variety of everyday materials and begin to describe their properties e.g. float/sink, cause shadows etc. I can explore changes such as changes in shape, melting and cooking.	
Year 1	I can distinguish between an object and the material from which it is made. I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. I can describe the simple physical properties of a variety of everyday materials. I can compare and group together a variety of everyday materials on the basis of their simple physical properties.	
Year 2	I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	
Year 3		I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. I can describe in simple terms how fossils are formed when things that have lived are trapped within rock. I can recognise that soils are made from rocks and organic matter.

Year 4	I can compare and group materials together, according to whether they are solids, liquids or gases. I can 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). I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	
Year 5	I can 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. I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. I can demonstrate that dissolving, mixing and changes of state are reversible changes. I can 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.	
Year 6		

Year Group	Physics				
	Light	Forces	Sound	Electricity	Earth and Space
EYFS (Nursery)		I can explore and talk about different forces I experience.			
EYFS (Reception)	I can explore coloured lights and shadows.				I can name planets in the solar system.
Year 1					
Year 2					
Year 3	I can recognise that I need light in order to see things and that dark is the absence of light. I can notice that light is reflected from surfaces. I can recognise that light from the sun can be dangerous and that there are ways to protect my eyes. I can recognise that shadows are formed when the light from a light source is blocked by an opaque object. I can find patterns in the way that the size of shadows change.	I can compare how things move on different surfaces. I can notice that some forces need contact between two objects, but magnetic forces can act at a distance. I can observe how magnets attract or repel each other and attract some materials and not others. I can 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. I can describe magnets as having two poles. I can predict whether two magnets will attract or repel each other, depending on which poles are facing.			

Year 4			I can identify how sounds are made, associating some of them with something vibrating. I can recognise that vibrations from sounds travel through a medium to the ear. I can find patterns between the pitch of a sound and features of the object that produced it. I can find patterns between the volume of a sound and the strength of the vibrations that produced it. I can recognise that sounds get fainter as the distance from the sound source increases.	I can identify common appliances that run on electricity. I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. I can 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. I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. I can recognise some common conductors and insulators, and associate metals with being good conductors.	
Year 5		I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. I can identify the effects of air resistance, water resistance and friction, that			I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. I can describe the movement of the Moon relative to the Earth.

		act between moving surfaces. I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.			I can describe the Sun, Earth and Moon as approximately spherical bodies. I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
Year 6	I can recognise that light appears to travel in straight lines. I can 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. I can 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. I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.			I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. I can 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. I can use recognised symbols when representing a simple circuit in a diagram.	

Science Progression Map - Disciplinary Knowledge

Please refer to the individual learning blocks for key vocabulary.

Year Group	Working Scientifically					
	Asking questions and recognising they can be answered in different ways	Answering questions	Making Observations and taking measurements	Recording and presenting evidence	Concluding, evaluating and raising further questions	Communicating findings
EYFS (Nursery)	I can question why things happen.	I can begin to test out ideas.	I can use my senses to explore the world around me. I can observe closely using a variety of means: magnifiers and photographs.	I can record observations in ways that are important and meaningful to me.	I can talk about what I see, using a wide vocabulary.	
EYFS (F2)	I can ask simple questions.	I can answer how and why questions about my experiences. I can choose resources and begin to handle equipment and tools effectively.	I can use simple equipment to make observations, e.g. hand lenses	I know about similarities and differences in relation to objects, materials and living things. I can create simple representations of events, people and objects.	I can make links and notice patterns. I can connect ideas and events.	
Year 1	I can use everyday language to ask simple questions and recognise that they can be answered in different ways.	I can follow instructions to complete a simple test individually or in a group.	I can observe objects, materials and living things and describe what I see. I can use simple non-standardised equipment and measurements in a practical task.	I can record observations, drawings, labelled diagrams and in writing. I can record measurements in prepared tables, pictograms, tally charts and bar charts. I can classify using simple prepared tables.	I can explain, with help, what I think I have found out.	

Year 2	I can ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum.	I can do things in the correct order when performing a simple test and begin to recognise when something is Unfair.	I can observe something closely and describe changes over time. I can use simple equipment such as hand lenses and egg timers to take measurements.	I can record observations more independently and in greater detail using observations, drawings, labelled diagrams and in writing. I can record measurements in prepared tables, pictograms, tally charts and bar charts. I can identify and classify using simple prepared tables and sorting rings.	I can use simple scientific language to explain what I have found out.	
Year 3	I can ask relevant questions using scientific language from the national curriculum and use different types of enquiry to answer them.	I can discuss enquiry methods and describe a fair test.	I can make decisions about what to observe during an investigation. I can take accurate measurements using standard units.	I can suggest how to record and present evidence using photographs, labelled diagrams and in writing. I can use tables, tally charts, and bar charts, (given templates if necessary). I can use Venn diagrams to record classifications.	I can draw, with help, a simple conclusion based on the evidence from an enquiry or observation. I can use secondary sources with adult support to help clarify results seen.	I can report on findings from enquiries, using presentations of results and conclusions.
Year 4	I can ask relevant questions using scientific language from the national curriculum and, with guidance, choose an appropriate enquiry to answer them.	I can make decisions about different enquiries, including recognising when a fair/comparative test is necessary and begin to identify variables.	I can make systematic and careful observations. I can take accurate measurements using standard units and a range of equipment such as thermometers.	I can begin to make decisions about how to record findings using tables, tally charts, bar charts and line graphs, e.g. a line graph for observations over time. I can use Venn and Carroll diagrams for classifications. With support, I can present the same data in different ways to help in answering a question.	I can, by identifying differences, similarities and pattersn, use recorded data to generate simple comparative statements based on my evidence, (the longer the elastic band, the lower the pitch), make predictions for new values, raise further questions and suggest improvements.	I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

Year 5	I can plan different types of scientific enquiries to answer questions, including recognising variables where necessary.	I can plan a range science enquiries including comparative and fair tests.	I can take measurements using a range of scientific equipment, e.g. Newton meters, with increasing accuracy and precision.	I can record data and results of increasing complexity using scientific diagrams, labels, classification keys, tables, bar and line graphs and models. I can present the same data in different ways to help with answering the question.	I can identify the scientific evidence that has been used to support or refute a hypothesis and how the conclusion might change based on further evidence. I can begin to recognise how scientific ideas change over time.	I can communicate findings to an audience using relevant scientific language and illustrations.
Year 6	I can plan different types of scientific enquiries to answer own or others' questions, including recognising and controlling variables where necessary.	I can select and plan the most suitable line of enquiry, explaining which variables need to be controlled and why, in a variety of comparative and fair tests.	I can make my own decisions about which observations to make, using test results to make predictions or set up further comparative or fair tests. I can choose the most appropriate equipment in order to take measurements, explaining how to use it accurately. I can make decisions about how to collect data, e.g. taking repeat readings, increasing sample size, adjust frequency of observation.	I can choose the most effective approach to record and report results linking to mathematical knowledge, e.g. bar chart for discrete data, line graph for continuous data, scatter graph when pattern seeking.	I can identify results that do not fit the overall pattern (anomalous results). I can identify the validity of a conclusion and how the investigation could be improved.	I can report and present findings from enquiries including conclusions, causal relationships and explanations of the degree of trust in the results.