Science Progression Map

INTENT

In Science, we intend to inspire pupils with a curiosity and fascination about the world around them. We will develop their scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. We will develop their scientific language, enabling children to talk about their methods and explain their findings and conclusions. The curriculum will motivate them to become effective communicators of scientific ideas, facts and data whilst enhancing their practical skills of scientific enquiry.

Key Learning Progression

	EYFS	Key Stage 1		Key Stage 2			
	Oak	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Animals, including Humans	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	**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. **Other 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.	**Survival and growth** *This unit will be done at the same time as* ***'Environment'*** *unit on* ***'Living Things and their Habitats'*** Notice that animals, have offspring which grow into adults. Find out about and describe the basic needs of animals, for survival (water, food and air).	**Humans – Skeletons and Movement** Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	**Humans – Teeth and Digestion** 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 *(NB: this point will be taught during the year 4 unit linked to environment).*	**Human Life cycles (incl. reproduction)** *(See also the unit 'ENVIRONMENT: Habitats and Life Cycles' as these can be taught alongside one another)* Describe the changes as humans develop to old age. Animals are alive; they move, feed, grow, use their senses, **reproduce**, breathe/respire and excrete.	**Circulatory System and Exercise** 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 exercise on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. Animals are alive; they move, feed, grow, use their senses, reproduce,

Science Progression Map

		Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, and including pets).					**breathe/respire** and excrete.
Health Animals, including humans	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	.	**How we Grow and Stay Healthy** Notice that humans, have offspring which grow into adults. Find out about and describe the basic needs of 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. Medicines can be useful when we are ill. Medicines can be harmful if not used properly	**Health and Nutrition** 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.			**Keeping Healthy - Diet and Lifestyle** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
Plants	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	**Plants** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	**Plants** Observe and describe how seeds and bulbs grow into mature plants.	**Plants** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.		**Living Things and their Habitats – see Environment unit** Observing life cycles of plants in the environment.	

Science Progression Map

		Identify and describe the basic structure of a variety of common flowering plants, including trees.	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	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.			
Environment	See the separate document entitled: 'Key Learning Progression EYFS to KS1.		**Living things and their habitats** 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		**Living things and their habitats** 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 Construct and interpret a variety of food chains,	**Living things and their habitats** **Observing life cycles** 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.	**Living things and their habitats** **Classification** 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

Science Progression Map

			plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including micro-habitats. 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.		identifying producers, predators and prey (NB: this point also in 'Animals – Teeth, eating and digestion') Recognise that environments can change and that this can sometimes pose dangers to living things.		animals based on specific characteristics.
Material Changes	See the separate document entitled: 'Key Learning Progression EYFS to KS1.				**States of matter** ***- see also the 'Material Properties' unit in Y4 'States of Matter'*** 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** **Reversible changes - Mixing and Separating** **Insoluble & Soluble Materials** 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,	

Science Progression Map

						sieving and evaporating Demonstrate that dissolving, mixing and changes of state are reversible changes. **Properties and Changes of Materials** **Irreversible changes - Changes that form new materials** 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.	
Material Properties	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	**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	**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	**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.	**States of Matter** Compare and group materials together, according to whether they are solids, liquids or gases. Solids, liquids and gases can be identified by their observable properties. Solids have a fixed size and shape (the	**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	

Science Progression Map

		a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties.	squashing, bending, twisting and stretching.	Recognise that soils are made from rocks and organic matter. Rocks and soils can feel and look different. Rocks and soils can be different in different places/environments.	size and shape can be changed but it remains the same after the action). Liquids can pour and take the shape of the container in which they are put. Liquids form a pool not a pile. Solids in the form of powders can pour as if they were liquids but make a pile not a pool. Gases fill the container in which they are put. Gases escape from an unsealed container. Gases can be made smaller by squeezing/pressure. Liquids and gases can flow.	Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Compare a variety of materials and measure their effectiveness (e.g. hardness, strength, flexibility, solubility, transparency, thermal conductivity, electrical conductivity) Temperature and Thermal Insulation Heat always moves from hot to cold. Some materials (insulators) are better at slowing down the movement of heat than others. Objects/liquids will warm up or cool down until they reach the temperature of their surroundings.	
Light and Astronomy	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	**Seasonal Changes** Observe changes across the four seasons.		**Light** Recognise that they need light in order to see things and that		**Earth and Space** Describe the movement of the Earth, and other planets, relative to	**Light** Recognise that light appears to travel in straight lines.

Science Progression Map

		Observe and describe weather associated with the seasons and how day length varies.		dark is the absence of light. 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 a solid object. Find patterns in the way that the size of shadows change.		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. The Earth spins once around its own axis in 24 hours, giving day and night. The Earth orbits the Sun in one year. We can see the Moon because the Sun's light reflects off it. The Moon orbits the Earth in approximately 28 days and changes to the appearance of the moon are evidence of this. The Sun *appears* to move across the sky from East to West	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 the light that 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.

Science Progression Map

						and this causes shadows to change during the day. Changes to shadow length over a day or changes to sunrise and sunset times over a year are evidence supporting the movement of the Earth. *(See **UKS2 'Forces'** for Key Learning on gravity).*	
Sound	See the separate document entitled: 'Key Learning Progression EYFS to KS1.				**Sound** **Vibrations** 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 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. **Pitch**		

Science Progression Map

					Find patterns between the pitch of a sound and features of the object that produced it. **Muffling/blocking sounds** Recognise that vibrations from sounds travel through a medium to the ear.		
Electricity	See the separate document entitled: 'Key Learning Progression EYFS to KS1.				**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 a lamp will light in a simple series circuit, based on whether 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.		**Electricity** 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. Circuit diagrams can be used to construct a variety of more complex circuits

Science Progression Map

					Recognise some common conductors and insulators, and associate metals with being good conductors. The following statutory requirement is in the NC2014 for year 5 'Properties and Changes of Materials' but can be taught here. Compare materials in order to make a switch in a circuit. Electricity can be dangerous. Electricity sources can be mains or battery. Batteries 'push' electricity round a circuit and can make bulbs, buzzers and motors work. Faults in circuits can be found by methodically testing connections. Drawings, photographs and diagrams can be used to represent circuits (although standard symbols need not be introduced until UKS2).		predicting whether they will 'work'.

Science Progression Map

Forces	See the separate document entitled: 'Key Learning Progression EYFS to KS1.			**Forces and magnets** Compare how some 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.		**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.	
Science Skills Progression							
Ideas and Evidence in Science	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	Can recognise that scientists find out about scientific ideas by asking questions and testing them.	Can recognise that scientists collect evidence by making observations and measurements in	Can recognise why it is important to collect evidence by making observations and measurements to	Can recognise that scientific ideas are based on evidence, have made our lives	Can describe how experimental evidence and creative thinking are combined to provide scientific	Can describe how experimental evidence and creative thinking are combined to provide scientific

Science Progression Map

			order to answer a question.	answer a question, and that science has made our lived better.	better and that there is some risk in science.	explanations, that has changed over time.	explanations, that change over time and has both positive and negative effects.
Asking questions and enquiry	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	Can ask some simple questions to find out about the world around us and with teacher guidance, recognise that they can be answered using different types of enquiry *(observing changes over time, noticing patterns, grouping/classifying, simple comparative tests and using secondary sources).*	Can ask simple questions to find out about the world around us and make simple suggestions about the different types of enquiry that could be used to collect evidence to answer a question *(observing changes over time, noticing patterns, grouping/classifying, simple comparative tests and using secondary sources).*	Can recognise how scientific ideas and concepts can be turned into relevant questions that can be investigate and put forward their own ideas about how to find the answer to a scientific question using different types of enquiries *(observing changes over time, noticing patterns, grouping/classifying, comparative tests, fair tests and using secondary sources).*	Can turn existing scientific ideas into a question form that can be investigated and begin to plan different types of scientific enquiries, including recognising and controlling variables with teacher guidance.	Can form scientific questions for enquiry based on scientific ideas/concepts and recognise which can be investigated and those which are theoretical. Plan different types of enquiries to answer questions, including identifying and controlling variables.	Can explore scientific ideas/concepts and form clear enquiry questions about scientific phenomena, recognising which can be investigated and those which are theoretical. Select and plan the most appropriate types of enquiry to answer questions, including identifying and controlling variables, where necessary.
Predicting and Hypothesising	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	Can make a simple prediction, 'I think…'	Can make a prediction with a simple reason, 'I think…because…'	Can make a prediction, giving a reason based on everyday experience.	Can make a prediction, giving a reason which considers scientific ideas and is based on everyday experience.	Can hypothesise, giving a reason which considers scientific ideas and uses knowledge of a similar everyday experience applied it to a new situation, e.g. I think little bits of sugar dissolve faster than a sugar lump.	Can hypothesise, giving a reason which is based on scientific concepts and uses knowledge of a similar everyday experience, applied it to a new situation, e.g. I think little bits of sugar dissolve faster than a sugar lump.
Planning an enquiry	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	Can plan a simple test guided by the teacher.	Can make a simple plan for a test within a framework provided by the teacher, e.g. using a planning frame or set of questions, focusing on a limited number of variables.	Can make a simple plan which identifies the basic features of the test, e.g. what is being changed, what is being measured and which variables are being controlled to keep the test fair.	Can decide on a clear plan to answer the question which identifies the key features of a fair test, e.g. what is being changed, what is being measured and which variables are being controlled to keep the test fair.	Can decide on an appropriate way to collect data to answer a question and with guidance, create a clear plan which identifies the independent, dependent and control variables.	Can identify and plan an appropriate approach to answer a scientific question, identifying clear independent, dependent and control variables.
Fair Testing	See the separate document entitled:	Can recognise unfairness and what is	Can, with teacher guidance, identify	Can carry out a fair test which identifies the	Can make a plan which identifies how one	Can identify key variables to be	Can identify key variables to be

Science Progression Map

	'Key Learning Progression EYFS to KS1.	being changed in a test.	what is being changed, what is being measured, and one or two variables which need to stay the same in order to make the test fair.	variable being changed, measured and controlled. Recognise and explain why it is fair.	variable is changed, while all the others are kept the same.	considered and with teacher guidance, choose one independent variable to change, decide how to measure the effect (dependent variable) and which variables to control.	considered and choose an appropriate variable to be varied (independent variable), measured for effect (dependent variable) and variables that need to be controlled.
Observing and Measuring	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	Can begin to observe closely using simple equipment provided and measure in non-standard units. For example, compare length, area and volumes visually, mass by feel, temperature by touch, time by clapping or ordering, sound, light force using senses.	Can use simple equipment provided to make observations and measurements related to the test, measuring in standard and non-standard units.	Can make observations and measurements which are relevant to the test. Can measure quantities in standard units, using a range of simple equipment.	Can select suitable equipment for a test and make a series of accurate observations and measurements which are adequate for the test.	Can select apparatus for a range of tests and use effectively, making a series of systematic observations, measurements and comparisons. Can recognise patterns and begin to repeat observations and measurements, offering simple explanations for any differences found.	Can select apparatus for a range of tests and use effectively, making a series of systematic observations, measurements and comparisons with precision appropriate to the test. Can recognise patterns and repeat observations and measurements, offering possible explanations for any differences found.
Investigating	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	Can perform simple tests with support.	Can perform simple tests.	Can set up simple practical enquiries and consider fair tests.	Can set up simple practical enquiries and consider comparative and fair tests.	Can set up practical enquiries and use results to begin to set up comparative and fair tests.	Can set up practical enquiries and use results to plan and set up further comparative and fair tests.
Recording results	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	Can describe simple features, observations and measurements and record in a variety of simple ways, e.g. pictures, words, provided tables.	Can describe observations and measurements in a variety of ways, including simple tables, labelled drawings, bar charts and through the use of scientific vocabulary.	Can record observations and measurements in a variety of ways, including ICT. Can record results in a variety of ways, including simple tables, labelled diagrams, keys and bar charts.	Can record observations, measurements and comparisons using tables, including ICT. Can construct their own tables, choosing headings and the number and range of measurements, draw labelled diagrams, keys and bar charts.	Can record observations and measurements systematically, including the use of ICT. Can begin to choose the best method, e.g. scientific diagrams, classification keys, tables, bar and line graphs, repeated tests and averaging (mean).	Can record observations and measurements systematically, including the use of ICT. Can record results of increasing complexity and choose the best recording method, e.g. scientific diagrams, classification keys, tables, bar and line graphs, repeated tests and averaging (mean).

Science Progression Map

Presenting results	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	Can, where appropriate, record observations in a bar chart (e.g. pictogram) with axis labelled by the teacher.	Can, where appropriate and supported by the teacher, record observations and measurements in simple bar charts.	Can, where appropriate, record observations and standard measurements in bar charts, deciding on the axes.	Can, where appropriate, record observations, measurements and comparisons using bar charts, choosing scale and labelling axes. Can begin to plot points to form simple graphs and use these to point out and interpret patterns in data.	Can, where appropriate, present data as bar charts and line graphs. Can construct bar and line graphs, selecting scale and labelling axes. Can begin to interpret and systematically explain patterns in data.	Can, where appropriate, choose to present increasingly complex data as bar charts and line graphs. Can construct bar and line graphs, selecting scale and labelling axes. Can interpret and systematically explain patterns in data.
Drawing conclusions	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	Can talk about what happened, communicating their findings in a simple way, e.g. talk, drawing, simple charts.	Can explain what happened and relate this to their earlier prediction made.	Can identify and explain simple patterns in recorded measurements and observations, and communicate what has been found in a simple scientific way.	Can begin to relate conclusions to patterns in data and to prior scientific knowledge and understanding. Can explain conclusions using appropriate scientific language.	Can draw conclusions which are consistent with evidence and relate these to scientific knowledge and understanding. Can use appropriate scientific language and conventions to communicate quantitative and qualitative data.	Can draw clear conclusions, which are linked to evidence from data patterns and relate these to scientific knowledge and understanding. Can use accurate scientific language and conventions to communicate quantitative/qualitative data and explain causal relationship.
Reviewing the test	See the separate document entitled: 'Key Learning Progression EYFS to KS1.	Can identify which parts of the test have been done well and which need to be improved.	Can question how carefully the test has been carries out and what needs improvement.	Can suggest improvements to the test to improve accuracy.	Can suggest improvements to the tests, giving reasons.	Can evaluate the accuracy of tests and make practical suggestions about how working methods could be improved.	Can evaluate the effectiveness of their tests, the limitations and suggestion how methods could be improved.
IMPACT (End Points)							

Science Progression Map

By the end of the year, children will:	EYFS	KEY STAGE 1		KEY STAGE 2			
	Oak	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
	Children to be able to identify similarities and differences in relation to places, objects, materials and living things. They are able to discuss the features of their own 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, carryout 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.