

Primary Science Skills and Knowledge Progression - Long Term Planning

EYFS	
<p>Preschool</p>	<p>Preschool Working Scientifically Skills: -To be able to use their senses to explore the natural world around them. -To be able to use their senses to explore materials. -To talk about what they see, using a wide vocabulary and begin to use newly introduced scientific vocabulary. -To be able to comment and begin to ask questions about aspects of their familiar world, such as the place where they live or the natural world. -To be able to talk about some of the things they have observed such as plants, animals, materials, natural and found objects. -To be able to talk about why things happen and how things work with some support. -To be able to develop a simple understanding of how they have grown and changed. -To be able to develop a simple understanding of growth, decay and changes over time in the natural world. -To be able to show care and concern for living things and the environment. -To be able to explore each season using their sense</p> <p>*UTW Knowledge Children from birth to three will; Explore materials with different properties. Explore natural materials, indoors and outside. Explore and respond to different natural phenomena in their setting and on trips. E.G. Changes in weather.</p> <p>Children aged three to four will; Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Explore how things work. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice. Explore the seasons.</p> <p>*Taken from Development Matters. Each school will explore different topics throughout the school year at a time that suits their cohorts needs and interests.</p>
<p>Reception</p>	<p>Reception Working Scientifically Skills: - To be able to use their senses to make observations and look closely at similarities, differences, patterns and change in relation to places, objects, materials and living things. -To use newly introduced scientific vocabulary and recall previous taught vocab. - To be able to talk about the features of their own environments and how these environments might vary from one another. - To be able to talk about changes they observe and why they happen. - To be able to ask questions about aspects of the familiar world. - To be able to make simple guesses about what might happen. - To be able to produce their own ideas of which resources to use and how to test ideas out. - To be able to use simple recording techniques, such as pictures or photographs. - To be</p>



	<p>able to describe what happened, using simple descriptions of objects and events. - To be able to use non-standard units when measuring. - To be able to use simple comparative statements to describe 'which worked best'. -To be able to explore each season using the senses and develop an understanding of changes that occur throughout the year. -To observe and interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water. -To be able to name and describe some plants and animals children are likely to see, encouraging children to recognise familiar plants and animals whilst outside.</p> <p>*UTW Knowledge Reception aged children will; Explore the natural world around them. Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them. Explore materials and use materials for a purpose Develop their knowledge of caring for and growing plants.</p> <p>*Taken from Development Matters. Each school will explore different topics throughout the school year at a time that suits their cohorts needs and interests.</p>					
	KS1	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1
Year 1	<p>Year 1 Working Scientifically Skills: Planning and Communication and Sources: -To be able to draw simple pictures. -To be able to talk about what they see and do. -To be able to use simple charts to communicate findings. -To be able to identify key features. -To be able to ask questions about what is being observed. Enquiring and Testing and Obtaining and Presenting Evidence: -To be able to test ideas suggested to them. -To be able to say what they think will happen. -To be able to use first hand experiences to answer questions. -To be able to begin to compare some living things. Observing and Recording: -To be able to make observations using appropriate senses. -To be able to record observations. -To be able to communicate observations orally, in drawing, labelling, simple writing and using ICT. Considering Evidence and Evaluating: -To be able to make simple comparisons and groupings. -To be able to say what has happened. -To be able to say whether what has happened was expected.</p>					
	<p>Working Scientifically Skills Revision: (3 weeks) Pupils will be taught to: -Investigate keeping safe and hygiene</p>	<p>Animals including Humans Knowledge: Pupils will be taught to: -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)</p>	<p>Plants Knowledge: Pupils will be taught to: -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</p>	<p>Everyday Materials Knowledge: Pupils will be taught to: -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</p>	<p>Magnetism Knowledge: Pupils will be taught to: -describe forces as a push or a pull and say what happens to objects when a force is applied. -identify everyday objects that use magnets. -identify the North Pole and South Pole of a magnet.</p>	



	-Investigate shadows and light -Investigate bubbles	-identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	flowering plants, including trees.	-compare and group together a variety of everyday materials on the basis of their simple physical properties.	-group together materials that are attracted to a magnet.
	<p><u>Year long investigation: How does your garden grow across the seasons?</u></p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -Observe changes across the four seasons -Observe and describe weather associated with the seasons and how day length varies. 				
Year 2	<p>Year 2 Working Scientifically Skills:</p> <p>Planning and Communication and Sources: -To be able to describe their observations using some scientific vocabulary. -To be able to use a range of simple texts to find information. - To be able to suggest how to find things out. - To be able to Identify key features and ask questions.</p> <p>Enquiring and Testing and Obtaining and Presenting Evidence: -To be able to use simple equipment provided to aid observation. -To be able to compare objects, living things or events. -To be able to make observations relevant to their task. -To be able to begin to recognise when a test or comparison is unfair. -To be able to use first hand experiences to answer questions.</p> <p>Observing and Recording: -To be able to respond to questions asked by the teacher. -To be able to ask questions. -To be able to collect and record data (supported by the teacher). -To be able to suggest how they could collect data to answer questions, begin to select equipment.</p> <p>Considering Evidence and Evaluating: -To be able to say what has happened. -To be able to say what their observations show and whether it was what they expected. -To be able to begin to draw simple conclusions and explain what they did. -To be able to begin to suggest improvements in their work.</p>				
	<p>Working Scientifically Skills Revision: (3 weeks)</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -Investigate rockets (forces and motion) -Investigate our senses -Investigate colours 	<p>Earth and Space Knowledge:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -name the planets of the solar system and understand that the sun is at the centre of the solar system. -describe how the moon appears to change shape. -describe how stars are grouped together to form constellations. -describe how the Earth's rotation causes day and night and how the tilt of the Earth causes the four seasons. 	<p>Animals including Humans Knowledge:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -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. 	<p>Materials Knowledge:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -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. 	<p>Living Things and their Habitats Knowledge:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -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.

Year long investigation: Round and Round the Garden - What is the lifecycle of a plant?

Pupils will be taught to: -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.

LKS2

Autumn Term 1

Autumn Term 2

Spring Term 1

Spring Term 2

Summer Term 1

Summer Term 2

Year 3

Year 3 Working Scientifically Skills:

Planning and Communication and Sources:

-To be able to use pictures, writing, diagrams and tables. -To be able to use simple texts to find information. -To be able to record their observations in written, pictorial and diagrammatic forms. -To be able to select the appropriate format to record observations.

Enquiring and Testing and Obtaining and Presenting Evidence:

-To be able to put forward ideas about how to find the answers to questions. -To be able to recognise the need to collect data to answer questions. -To be able to carry out a fair test with support. -To be able to recognise and explain why it is a fair test. -To be able to begin to realise that scientific ideas are based on evidence from research.

Observing and Recording:

-To be able to make relevant observations. -To be able to measure using given equipment. -To be able to select equipment.

Considering Evidence and Evaluating:

-To be able to begin to offer explanations for what they see and communicate in a scientific way what they have found out. -To be able to begin to identify patterns in recorded measurements. -To be able to suggest improvements in their work. -To be able to evaluate their findings.

Working Scientifically: (3 weeks)

Pupils will be taught to:
-Investigate properties of materials.
-Investigate food group benefits.
-Investigate objects floating and sinking.

Rocks and Soils:

Pupils will be taught to:
-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.

Light and Shadows:

Pupils will be taught to:
-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.

Plants:

Pupils will be taught to:
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

Animals including Humans:

Pupils will be taught to:
-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.

Forces and Magnetism:

Pupils will be taught to:
-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.

				formation and seed dispersal.		
Year 4	<p>Year 4 Working Scientifically: Planning and Communication and Sources: -To be able to record observations, comparisons and measurements using tables and bar charts. -To be able to begin to plot points to form a simple graph. -To be able to use graphs to point out and interpret patterns in their data. -To be able to select information from a range of sources provided for them. Enquiring and Testing and Obtaining and Presenting Evidence: -To be able to begin to realise that scientific ideas are based on evidence. -To be able to show how to vary one factor while keeping others the same. -To be able to decide on an appropriate approach in their own investigations to answer questions. -To be able to describe which factors are being varied and which will remain the same, saying why. Observing and Recording: -To be able to carry out experiments, measuring accurately as required. -To be able to make a series of observations, comparisons and measurements. -To be able to select and use suitable equipment. -To be able to make a series of observations and measurements adequate for the task. Considering Evidence and Evaluating: -To be able to predict outcomes using previous experience and knowledge and compare them with actual results. -To be able to begin relating conclusions to scientific knowledge and understanding. -To be able to suggest improvements to investigations, giving reasons.</p>					
	<p>Working Scientifically: (3 weeks) Pupils will be taught to: -Investigate light and shadows. -Investigate magnetism. -Investigate minibeasts habitats and activity -Investigate the skeleton (bones and muscles).</p>	<p>Living Things and Habitats: Pupils will be taught to: -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.</p>	<p>Sound: Pupils will be taught to: -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.</p>	<p>States of Matter: Pupils will be taught to: -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.</p>	<p>Animals including Humans: Pupils will be taught to: -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.</p>	<p>Electricity: Pupils will be taught to: -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 associating 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.</p>



UKS2	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Year 5	<p><u>Year 5 Working Scientifically:</u></p> <p>Planning and Communication and Sources:</p> <ul style="list-style-type: none"> -To be able to record observations systematically. -To be able to use appropriate scientific language and conventions to communicate quantitative and qualitative data. -To be able to select a range of appropriate sources of information including books and the internet. <p>Enquiring and Testing and Obtaining and Presenting Evidence:</p> <ul style="list-style-type: none"> -To be able to use previous knowledge and experience combined with experimental evidence to provide scientific explanations. -To be able to recognise the key factors to be considered in carrying out a fair test. <p>Observing and Recording:</p> <ul style="list-style-type: none"> -To be able to make a series of observations, comparisons and measurements with increasing precision. -To be able to select apparatus for a range of tasks. -To be able to plan to use apparatus effectively. -To be able to begin to make repeat observations and measurements systematically. <p>Considering Evidence and Evaluating:</p> <ul style="list-style-type: none"> -To be able to make predictions based on their scientific knowledge and understanding. -To be able to draw conclusions that are consistent with evidence. -To be able to relate evidence to scientific knowledge and understanding. -To be able to offer simple explanations for any differences in their results. -To be able to make practical suggestions about how their working methods could be improved. 					
	<p>Working Scientifically: (3 weeks)</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -Investigate the rock cycle. -Investigate light and shadows. -Investigate sound travel. 	<p>Earth and Space:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -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. 	<p>Forces and Motion:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -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 	<p>Plants and Living things:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -Describe the differences in the life cycle of a mammal, amphibians, insects and birds. -Describe the life process of reproduction in some plants and animals. 	<p>Animals including humans:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -Describe the changes as humans develop to old age. 	<p>States of Matter:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -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. -Know 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.



			levers, pulleys and gears, allow a smaller force to have a greater effect.			<ul style="list-style-type: none"> -Give evidence based reasons for the particular uses of everyday material. (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.(Burning and the action of acid or bicarbonate of soda)
Year 6	<p>Year 6 Working Scientifically:</p> <p>Planning and Communication and Sources:</p> <ul style="list-style-type: none"> -To be able to choose scales for graphs which show data and features effectively. -To be able to identify measurements and observations which do not fit into the main pattern. -To be able to begin to explain anomalous data. -To be able to use appropriate ways to communicate quantitative data using scientific language. <p>Enquiring and Testing and Obtaining and Presenting Evidence:</p> <ul style="list-style-type: none"> -To be able to describe evidence for a scientific idea. -To be able to use scientific knowledge to identify an approach for an investigation. -To be able to explain how the interpretation leads to new ideas. <p>Observing and Recording:</p> <ul style="list-style-type: none"> -To be able to measure quantities with precision using fine-scale divisions. -To be able to select and use information effectively. -To be able to make enough measurements or observations for the required task. <p>Considering Evidence and Evaluating:</p> <ul style="list-style-type: none"> -To be able to make reasoned suggestions on how to improve working methods. -To be able to show how interpretation of evidence leads to new ideas. -To be able to explain conclusions, showing understanding of scientific ideas. 					
	<p>Evolution and Inheritance:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -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 	<p>Light:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -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. 	<p>All living things and Habitats:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including 	SATS PREP	<p>Animals including Humans:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -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. 	<p>Electricity:</p> <p>Pupils will be taught to:</p> <ul style="list-style-type: none"> -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



	<p>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.</p>	<p>-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.</p>	<p>microorganisms, plants and animals. -Give reasons for classifying plants and animals based on specific characteristics.</p>			<p>-Use recognised symbols when representing a simple circuit in a diagram.</p>
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