

## Science knowledge and skills progression map

### EYFS

Children in EYFS begin the foundations of science through their work on Understanding of the world. Understanding of the world involves guiding children to make sense of their physical world and their community.

#### Children in EYFS need to:

- Explore the natural world around them.
- Care for the natural world around them.
- Draw pictures of the natural world
- 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.

#### Children in EYFS will be learning to:

- Describe what they see, hear and feel whilst outside
  - Describe and comment on things they have seen whilst outside, including plants and animals
    - Begin to recognise familiar plants and animals whilst outside.
- Understand the effect of changing seasons on the natural world around them and begin to notice weather and seasonal features.

### Year 1

#### Scientific skills

Working scientifically	Questioning and enquiry	Observing and measuring	Investigating	Recording	Grouping and classifying
To use practical scientific methods processes and skills (adult support may be needed)	Ask simple questions about the world around us.	Begin to observe closely, using simple equipment.  Use simple observations and ideas to suggest answers to questions.	Perform simple tests with support.  To begin to discuss my ideas about how to find things out.  To begin to say what happened in my investigation.	Gather and record data with some adult support, to help in answering questions.  Begin to record and communicate their findings in a range of ways.  Can show my results in a simple table that my teacher has provided.	To begin to observe and identify, compare and describe.  To begin to use simple features to compare objects, materials and living things and, with help, decide how to sort and group them.

## Science knowledge and skills progression map

Knowledge					
<b>Plants</b>	<b>Animals including humans</b>	<b>Materials</b>	<b>Seasonal changes</b>		
<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees</p>	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p>	<p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies throughout the year</p>		
Year 2					
Scientific skills					
<b>Working scientifically</b>	<b>Questioning and enquiry</b>	<b>Observing and measuring</b>	<b>Investigating</b>	<b>Recording</b>	<b>Grouping and classifying</b>
To use practical scientific methods, processes and skills with increasing confidence -	Ask questions about the world around us.	Observe closely, using simple equipment. Use observations and ideas to suggest answers to questions.	Perform simple tests. To discuss my ideas about how to find things out. To say what happened in my investigation.	Gather and record data to help in answering questions. Record simple data. Record and communicate their findings in a range of ways.	Identify and classify. Observe and identify, compare and describe.

### Science knowledge and skills progression map

				Can show my results in a table that my teacher has provided.	
Knowledge					
<b>Plants</b>	<b>Animals including humans</b>	<b>Materials</b>	<b>Living things and their habitats</b>		
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	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) – Habitat Hunters Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.- Spring 2	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.	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.		
Year 3					
Scientific skills					
<b>Working scientifically</b>	<b>Questioning and enquiry</b>	<b>Observing and measuring</b>	<b>Investigating</b>	<b>Recording</b>	<b>Grouping and classifying</b>

## Science knowledge and skills progression map

<p>To use practical scientific methods, processes and skills</p>	<p>Ask some relevant questions and use different types of scientific enquiries to answer them.</p>	<p>Begin to make systematic and careful observations. Take accurate measurements using standard and non- standard measurements. Begin to use a range of equipment. Begin to look for naturally occurring patterns and relationships. Help to make decisions on how to carry out an investigation</p>	<p>Set up simple practical experiments focusing on comparative and fair tests and begin to know when a fair test is necessary and decide how to set it up. Begin to think of more than one variable factor</p>	<p>Gather, record, and begin to classify and present data in a variety of ways to help answer a question. Begin to record findings using scientific vocabulary, drawings, labelled diagrams, keys, bar charts and tables. Begin to report on findings including oral and written explanations, displays and presentations. Begin to use notes, simple tables and standard units to record and analyse data.</p>	<p>Begin to identify similarities and differences related to scientific ideas and processes. Talk about criteria for grouping, sorting and classifying using simple keys. Begin to compare and group according to behaviour or properties, based on testing.</p>
<p>Knowledge</p>					
<p>Plants</p>	<p>Animals including humans</p>	<p>Rocks</p>	<p>Forces and magnets</p>	<p>Light</p>	
<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>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</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>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</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from rocks and organic matter</p>	<p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>Describe magnets as having two poles</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>Find patterns in the way that the size of shadows change.</p>	

## Science knowledge and skills progression map

Year 4					
Scientific skills					
<b>Working scientifically</b>	<b>Questioning and enquiry</b>	<b>Observing and measuring</b>	<b>Investigating</b>	<b>Recording</b>	<b>Grouping and classifying</b>
To use practical scientific methods, processes and skills	Ask relevant questions and use different types of scientific enquiries to answer them.	Make systematic and careful observations, take accurate measurements using standard units and a range of equipment, including thermometers and data loggers. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. Help make decisions about what observations and equipment they will need to use.	Set up simple practical experiments, comparative and fair tests. Recognise when a simple fair test is necessary and help to decide how to set it up. Be able to think of more than one variable factor.	Gather, record, classify and present data in a variety of ways to answer a question. Record simple findings using scientific vocabulary, drawings, labelled diagrams, keys, bar charts and tables. Report on findings including oral and written explanation, displays or presentation of results and conclusions. Use notes, simple tables and standard units to decide how to record and analyse data.	Identify differences, similarities and changes related to scientific ideas and processes. Talk about criteria for grouping, sorting and classifying and use simple keys. Compare and group according to behaviour or properties, based on testing
Knowledge					
<b>Living things and their habitat</b>	<b>Animals including humans</b>	<b>States of matter</b>	<b>Sound</b>	<b>Electricity</b>	
<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Recognise that environments can change and that this can</p>	<p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>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)</p> <p>Identify the part played by evaporation and condensation in</p>	<p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p>	<p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the</p>	

### Science knowledge and skills progression map

sometimes pose dangers to living things.		the water cycle and associate the rate of evaporation with temperature.	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.	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.	
<b>Year 5</b>					
<b>Scientific skills</b>					
<b>Working scientifically</b>	<b>Questioning and enquiry</b>	<b>Observing and measuring</b>	<b>Investigating</b>	<b>Recording</b>	<b>Grouping and classifying</b>
To use practical scientific methods, processes and skills  (covered in a variety of ways throughout the year)	Begin to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.  (covered in a variety of ways throughout the year)	Begin to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. Begin to identify patterns that might be found in the natural environment. Begin to make own decisions about what observations, measurements, and equipment to use. Begin to interpret data. Begin to make accurate and precise measurements- N, g, kg, mm, cm, mins, seconds, cm <sup>2</sup> V, km/h, m per sec, m/ sec Graphs - pie, line (covered in a variety of ways throughout the year)	Begin to test results to make predictions to set up further comparative and fair tests. Begin to recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Begin to suggest improvements to the method and give reasons.  (covered in a variety of ways throughout the year)	Begin to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs. Begin to report and present findings from enquiries. Begin to decide how to record data from a choice of familiar approaches. Begin to choose how best to present data.  (covered in a variety of ways throughout the year)	Begin to use and develop keys and other information record to identify, classify and describe living things and materials.

## Science knowledge and skills progression map

Knowledge					
Living things and their habitat	Materials	Animals including humans	Forces and magnets	Earth and space	
<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals.</p>	<p>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</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>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.</p>	<p>Describe the changes as humans develop to old age.</p>	<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>	<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>Describe the movement of the Moon relative to the Earth</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>	

## Science knowledge and skills progression map

Year 6					
Scientific skills					
Working scientifically	Questioning and enquiry	Observing and measuring	Investigating	Recording	Grouping and classifying
<p>To use practical scientific methods, processes and skills</p>	<p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p>	<p>Take measurements using a range of scientific equipment with increasing accuracy and precision. Take repeat readings where appropriate. Identify patterns that might be found in the natural environment. Make own decisions about what observations, measurements to use and whether or not to repeat them. Choose most appropriate equipment. Interpret data and find patterns. Select equipment independently. Use accurate and precise measures</p>	<p>Use test results to make predictions to set up further comparative and fair tests. Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Suggest improvements to methods and give reasons. Decide when it is appropriate to do a fair test.</p>	<p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs. Report and present findings from enquiries. Decide how to record data from a choice of familiar approaches. Choose how best to present data</p>	<p>Use and develop keys and other information records to identify, classify and describe living things and materials.</p>
Knowledge					
Living things and their habitat	Evolution and inheritance	Animals including humans	Light	Electricity	
<p>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</p>	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p>	<p>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> <p>Explain that we see things because light travels from light sources to our eyes or from light</p>	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers</p>	

## Science knowledge and skills progression map

<p>Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>	<p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>	<p>sources to objects and then to our eyes</p> <p>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>and the on/off position of switches</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	
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