

# Scientific Knowledge and Conceptual Understanding Progression Chart

## Curriculum Aims

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The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

## EYFS

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### Understanding the World: The Natural World

- Explore the natural world around them, making observations and drawing pictures of animals and plants
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter





### Personal, Social and Emotional Development – managing self

- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices





# Biology Content KS1

Animals including humans	Plants	Living things and their habitats	Evolution
			
<p>I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>I can compare a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>I can identify and name a variety of common animals that are carnivores, omnivores and herbivores.</p> <p>I can identify, name, draw and label the basic parts of the human body.</p> <p>I can identify which part of the body is associated with each sense.</p> <p>I can compare humans.</p> <p>I can find out about and describe the basic needs of animals, including humans, for survival.</p> <p>I notice that animals, including humans have offspring which grow into adults.</p> <p>I can describe the importance for humans to exercise.</p> <p>I can describe the importance for humans to eat the right amounts of different types of food.</p> <p>I can describe the importance for humans to have good hygiene.</p> <p>I can describe the importance for humans to look after themselves.</p>	<p>I can identify different plants.</p> <p>I can identify and describe the basic structure of plants.</p> <p>I understand that plants can grow.</p> <p>I can name a variety of common wild plants.</p> <p>I can sort a variety of plants.</p> <p>I can name a variety of common plants that we can eat.</p> <p>I can identify, name and describe the basic structure of deciduous and evergreen trees.</p> <p>I can identify that fruit, vegetables and herbs are types of plant that we eat.</p> <p>I can observe and describe how seeds grow into mature plants.</p> <p>I know what plants need to grow and stay healthy.</p> <p>I can explain the life cycle of plants.</p>	<p>I can explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>I can identify and name a variety of plants and animals in their habitats, including microhabitats.</p> <p>I can identify and name a variety of plants and animals in their habitats.</p> <p>I can identify that most living things live in a habitat to which they are suited.</p> <p>I can construct a simple food chain</p>	




# Biology Content LKS2

Animals including humans	Plants	Living things and their habitats	Evolution
			
<p>I can identify that humans have bones for support, protection and movement.</p> <p>I can identify that some other animals have bones for support, protection and movement.</p> <p>I understand that animals, including humans, need the right type of nutrition.</p> <p>I can name the basic parts of the digestive system and describe their functions.</p> <p>I can identify the different teeth and describe their functions.</p> <p>I can construct and interpret a variety of food chains.</p> <p>I understand what producers, predators and prey are.</p>	<p>I can explore the requirements of plants for life and growth.</p> <p>I can identify, locate and describe the function of different parts of flowering plants.</p> <p>I can identify, locate and describe the function of the roots in plants.</p> <p>I can investigate the way in which water is transported within plants.</p> <p>I can explore the part that flowers play in the life cycle of flowering plants, including pollination.</p> <p>I can explore the part that flowers play in the life cycle of flowering plants, including seed formation and seed dispersal.</p>	<p>I can recognise that living things can be grouped in a variety of ways.</p> <p>I can explore and use classification keys to help group, identify and name a variety of living things in my local environment.</p> <p>I can recognise that environments can change and that this can sometimes pose dangers to living things.</p>	




# Biology Content UKS2

Animals including humans	Plants	Living things and their habitats	Evolution
			
<p>I can describe the human life cycle.</p> <p>I understand how a foetus develops in the womb.</p> <p>I can describe what happens when I am a teenager.</p> <p>I can describe what happens when I am a senior.</p> <p>I can identify and name the main parts of the human circulatory system.</p> <p>I can identify and name the main parts of the heart.</p> <p>I can describe how water and nutrients are transported in humans.</p> <p>I can identify how humans can live a healthy lifestyle.</p>		<p>I can discuss the seven life processes.</p> <p>I can explain how mammals</p> <p>I can explain how animals</p> <p>I understand reproduction in plants.</p> <p>I can describe the differences in the life cycles of mammals, amphibians, reptiles, insects and birds.</p> <p>I can explain the life cycle of plants.</p> <p>I can describe how living things can be classified into broad groups.</p> <p>I understand how I can use classification keys to help group, identify and name a variety of living things.</p> <p>I can describe how living things can be classified into broad groups.</p> <p>I understand that microorganisms are also living things.</p> <p>I can describe how living things can be classified into broad groups.</p> <p>I know that scientists have developed different ways to classify living things.</p>	<p>I can identify how plants are adapted to their environment.</p> <p>I can identify how animals are adapted to their environment.</p> <p>I can explain natural selection and how it may lead to evolution.</p> <p>I can explain how adaptations may lead to evolution.</p> <p>I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>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.</p>




# Chemistry Content KS1

Materials	Rocks	States Of Matter
		
<p>I can identify a variety of everyday materials.</p> <p>I can describe the physical properties of a variety of everyday materials.</p> <p>I can distinguish between an object and the material from which it is made.</p> <p>I can compare and group together a variety of everyday materials on the basis of their simple physical properties.</p> <p>I can identify a variety of everyday materials.</p> <p>I can distinguish between an object and the material it is made from.</p> <p>I can investigate the properties of different materials.</p>		







# Chemistry Content LKS2

Materials	Rocks	States of Matter
		
	<p>I can compare and group together different kinds of rocks on the basis of their</p> <p>I can compare and group together different kinds of rocks on the basis of their physical properties.</p> <p>I can explain how some rocks are formed.</p> <p>I can explain how the Earth is made up of different layers of rocks and soils</p> <p>I can describe how fossils are formed when things that have lived are trapped within rock.</p>	<p>I can identify solids, liquids and gases.</p> <p>I can take accurate measurements using thermometers.</p> <p>I can observe that some materials change state when they are heated or cooled.</p> <p>I can identify the part played by evaporation and condensation in the water cycle.</p> <p>I can associate the rate of evaporation with temperature.</p>

# Chemistry Content UKS2







Materials	Rocks	States of Matter
		
<p>I can compare and group materials according to whether they are solids, liquids or gases and name their properties.</p> <p>I can describe the properties of materials using scientific vocabulary.</p> <p>I can investigate the thermal insulation of different materials.</p> <p>I can compare and group materials based on their response to magnets.</p> <p>I know that some materials dissolve in a liquid to make a solution.</p> <p>I can predict how I could separate mixtures.</p> <p>I can explain why some changes are irreversible.</p>		

# Physics Content KS1







Forces and magnets	Seasonal change	Earth and space	Electricity	Sound	Light
					
	<p>I can observe and describe changes across the four seasons.</p> <p>I can observe how day length varies.</p> <p>I can describe weather associated with the seasons.</p>				



# Physics Content LKS2

Forces and magnets	Seasonal change	Earth and space	Electricity	Sound	Light
					
<p>I can compare how different things move.</p> <p>I can compare how objects move on different surfaces</p> <p>I can explore how magnetic forces act at a distance.</p> <p>I can compare and group various everyday materials based on whether they are attracted to a magnet.</p> <p>I can predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <p>I can record my findings using simple scientific vocabulary.</p>			<p>I can identify common appliances that use electricity. I can construct a simple circuit and name the parts of the circuit.</p> <p>I can identify if a bulb will light up in a circuit.</p> <p>I can recognise common conductors and insulators.</p> <p>I can investigate switches.</p>	<p>I can identify how sounds are made, associating some of them with something vibrating.</p> <p>I can recognise that vibrations from sounds travel through a medium to the ear.</p> <p>I can find patterns between the pitch of a sound and features of the object that produced it.</p> <p>I can find patterns between the volume of a sound and the strength of the vibrations that</p>	<p>I can recognise that there needs to be light in order to see things and that darkness is the absence of light</p> <p>I can notice that light is reflected from surfaces.</p> <p>I can recognise that light from the Sun can be dangerous and that there are ways to protect your eyes and skin from the Sun.</p> <p>I can recognise that shadows are formed when light from a light source is blocked by an opaque object.</p> <p>I know that shadows take on the shape of the opaque object.</p> <p>I can predict where a shadow will form in relation to an opaque object and a light source.</p> <p>I can find patterns in the way that the length of shadows change.</p>

# Physics Content UKS2

Forces and magnets	Seasonal change	Earth and space	Electricity	Sound	Light
					
<p>I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and falling objects.</p> <p>I can identify the effect of friction between moving surfaces.</p> <p>I can identify the effect of air resistance.</p> <p>I can identify the effect of water resistance.</p> <p>I can recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p>		<p>I can describe the planets in the solar system.</p> <p>I can describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>I can describe the movement of the Moon relative to the Earth.</p> <p>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.</p> <p>I can describe the movement of the Moon relative to the Earth.</p>	<p>I can use symbols when drawing a simple circuit diagram.</p> <p>I can associate the brightness of a lamp with the number and voltage of cells used in the circuit.</p> <p>I can investigate variations in how components function.</p> <p>I can name renewable and non-renewable sources of energy.</p>		<p>I can recognise that light appears to travel in straight lines.</p> <p>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.</p> <p>I can explain how the eye works.</p> <p>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.</p> <p>I can explain how shadows change during the day.</p>

