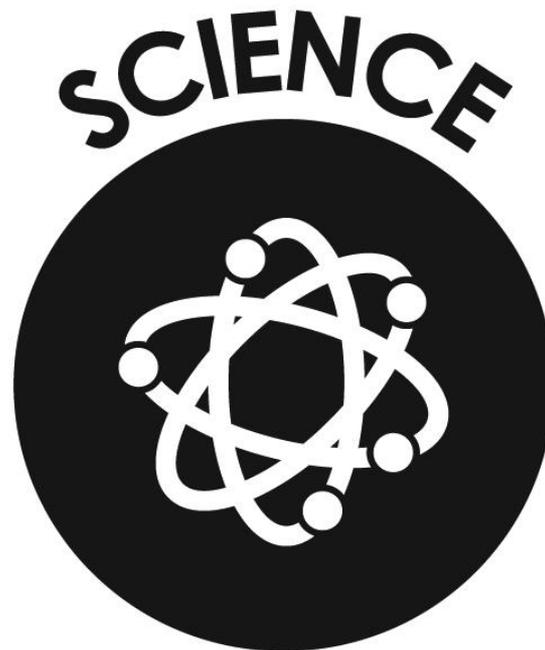


# Progression of skills across the Science Curriculum



## Curriculum Aims

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

### **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

## Substantive Knowledge: Year 1

Biology			Chemistry	Physics
Animals, including Humans	Animals, including Humans	Plants	Everyday Materials	Seasonal Change
<ul style="list-style-type: none"> <li>• Name common animals</li> <li>• Carnivores, etc</li> </ul>	<ul style="list-style-type: none"> <li>• Human body and senses</li> </ul>	<ul style="list-style-type: none"> <li>• Common plants</li> <li>• Plant structure</li> </ul>	<ul style="list-style-type: none"> <li>• Properties of materials</li> <li>• Grouping materials</li> </ul>	<ul style="list-style-type: none"> <li>• The four seasons</li> <li>• Seasonal weather</li> </ul>
<ul style="list-style-type: none"> <li>• Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds</li> <li>• Know and classify animals by what they eat (carnivore, herbivore and omnivore)</li> <li>• Know how to sort by living and non living things</li> </ul>	<ul style="list-style-type: none"> <li>• Know the name of parts of the human body that can be seen</li> <li>• Know which part of the body associated with each of the five senses.</li> </ul>	<ul style="list-style-type: none"> <li>• Know and name a variety of common wild and garden plants</li> <li>• Know and name the petals, stem, leaves and root of a plant</li> <li>• Know and name the roots, trunk, branches and leaves of a tree</li> </ul>	<ul style="list-style-type: none"> <li>• Know the name of the materials an object is made from</li> <li>• Know about the properties of everyday materials</li> </ul>	<ul style="list-style-type: none"> <li>• Name the seasons and know about the type of weather associated with each season</li> <li>• Know the main months associated with each season</li> </ul>

## Substantive Knowledge: Year 2

Biology			Chemistry	
All living things and their habitats	Animals, including Humans	Plants	Everyday Materials	
<ul style="list-style-type: none"> <li>• <i>Alive or dead</i></li> <li>• <i>Habitats</i></li> <li>• <i>Adaptations</i></li> <li>• <i>Food chains</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Animal reproduction</i></li> <li>• <i>Healthy living</i></li> <li>• <i>Basic needs</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Plant and seed growth</i></li> <li>• <i>Plant reproduction</i></li> <li>• <i>Keeping plants healthy</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Identify different materials</i></li> <li>• <i>Name everyday materials</i></li> <li>• <i>Properties of materials</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Compare the use of different materials</i></li> <li>• <i>Compare movement on different surfaces</i></li> </ul>
<ul style="list-style-type: none"> <li>• Classify things by living, dead or never lived</li> <li>• Know how a specific habitat provides for the basic needs of things living there (plants and animals)</li> <li>• Match living things to their habitat</li> <li>• Name some different sources of food for animals</li> <li>• Know about and explain a simple food chain</li> </ul>	<ul style="list-style-type: none"> <li>• Know the basic stages in a life cycle for animals, (including humans)</li> <li>• Know why exercise, a balanced diet and good hygiene are important for humans</li> </ul>	<ul style="list-style-type: none"> <li>• Know and explain how seeds and bulbs grow into plants</li> <li>• Know what plants need in order to grow and stay healthy (water, light &amp; suitable temperature)</li> </ul>	<ul style="list-style-type: none"> <li>• Know how materials can be changed by squashing, bending, twisting and stretching</li> </ul>	<ul style="list-style-type: none"> <li>• Know why a material might or might not be used for a specific job</li> </ul>

## Substantive Knowledge: Year 3

Substantive Knowledge: Year 3					
Biology			Chemistry	Physics	
Animals, including humans	Plants	Plants	Rocks	Forces	Light
<ul style="list-style-type: none"> <li>• <i>Skeleton and muscles</i></li> <li>• <i>Nutrition</i></li> <li>• <i>Exercise and health</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Plant life</i></li> <li>• <i>Basic structure and functions</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Life cycle</i></li> <li>• <i>Water transportation</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Fossil formation</i></li> <li>• <i>Compare and group rocks</i></li> <li>• <i>Soil</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Different Forces</i></li> <li>• <i>Magnets</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Reflections</i></li> <li>• <i>Shadows</i></li> </ul>
<ul style="list-style-type: none"> <li>• Know about the importance of a nutritious, balanced diet</li> <li>• Know how nutrients, water and oxygen are transported within animals and humans</li> <li>• Know about the skeletal and muscular system of a human</li> </ul>	<ul style="list-style-type: none"> <li>• Know the function of different parts of flowering plants and trees</li> </ul>	<ul style="list-style-type: none"> <li>• Know how water is transported within plants</li> <li>• Know the plant life cycle, especially the importance of flowers</li> </ul>	<ul style="list-style-type: none"> <li>• Compare and group rocks based on their appearance and physical properties, giving reasons</li> <li>• Know how soil is made and how fossils are formed</li> <li>• Know about and explain the difference between sedimentary, metamorphic and igneous rock</li> </ul>	<ul style="list-style-type: none"> <li>• Know about and describe how objects move on different surfaces</li> <li>• Know how a simple pulley works and use to on to lift an object</li> <li>• Know how some forces require contact and some do not, giving examples</li> <li>• Know about and explain how magnets attract and repel Predict whether magnets will attract or repel and give a reason</li> </ul>	<ul style="list-style-type: none"> <li>• Know that dark is the absence of light</li> <li>• Know that light is needed in order to see and is reflected from a surface</li> <li>• Know and demonstrate how a shadow is formed and explain how a shadow changes shape</li> <li>• Know about the danger of direct sunlight and describe how to keep protected</li> </ul>

# Substantive Knowledge: Year 4

Biology		Chemistry	Physics	
Animals, including humans	All living things and their habitats	States of Matter	Electricity	Sound
<ul style="list-style-type: none"> <li>• Digestive system</li> <li>• Teeth</li> <li>• Food chains</li> </ul>	<ul style="list-style-type: none"> <li>• Grouping living things</li> <li>• Classification keys</li> <li>• Adaptation of living things</li> </ul>	<ul style="list-style-type: none"> <li>• Compare and group materials</li> <li>• Solids, liquids and gases</li> <li>• Changing state</li> <li>• Water cycle</li> </ul>	<ul style="list-style-type: none"> <li>• Uses of electricity</li> <li>• Simple circuits and switches</li> <li>• Conductors and insulators</li> </ul>	<ul style="list-style-type: none"> <li>• How sounds are made</li> <li>• Sound vibrations</li> <li>• Pitch and Volume</li> </ul>
<ul style="list-style-type: none"> <li>• Identify and name the parts of the human digestive system</li> <li>• Know the functions of the organs in the human digestive system</li> <li>• Identify and know the different types of human teeth</li> <li>• Know the functions of different human teeth</li> <li>• Use and construct food chains to identify producers, predators and prey</li> </ul>	<ul style="list-style-type: none"> <li>• Use classification keys to group, identify and name living things</li> <li>• Know how changes to an environment could endanger living things</li> <li>• Group materials based on their state of matter (solid, liquid or gas)</li> </ul>	<ul style="list-style-type: none"> <li>• Know the temperature at which materials change state</li> <li>• Know about and explore how some materials can change state</li> <li>• Know the part played by evaporation and condensation in the water cycle</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and name appliances that require electricity to function</li> <li>• Construct a series circuit</li> <li>• Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers)</li> <li>• Predict and test whether a lamp will light within a circuit</li> <li>• Know the function of a switch</li> <li>• Know the difference between a conductor and an insulator; giving examples of each</li> </ul>	<ul style="list-style-type: none"> <li>• Know how sound is made, associating some of them with vibrating</li> <li>• Know how sound travels from a source to our ears</li> <li>• Know the correlation between pitch and the object producing a sound</li> <li>• Know the correlation between the volume of a sound and the strength of the vibrations that produced it</li> <li>• Know what happens to a sound as it travels away from its source</li> </ul>

# Substantive Knowledge: Year 5

<b>Biology</b>		<b>Chemistry</b>	<b>Physics</b>	
<b>All living things and their habitats</b>	<b>Animals, including humans</b>	<b>Properties and changes in materials</b>	<b>Forces</b>	<b>Earth and Space</b>
<ul style="list-style-type: none"> <li>• <i>Life cycles – plants and animals</i></li> <li>• <i>Reproductive processes</i></li> <li>• <i>Famous naturalists</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Changes as humans develop from birth to old age</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Compare properties of everyday materials</i></li> <li>• <i>Soluble/ dissolving</i></li> <li>• <i>Reversible and irreversible substances</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Gravity</i></li> <li>• <i>Friction</i></li> <li>• <i>Forces and motion of mechanical devices</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Movement of the Earth and the planets</i></li> <li>• <i>Movement of the Moon</i></li> <li>• <i>Night and day</i></li> </ul>
<ul style="list-style-type: none"> <li>• Know the life cycle of different living things e.g. mammal, amphibian, insect and bird</li> <li>• Know the differences between different life cycles</li> <li>• Know the process of reproduction in plants</li> <li>• Know the process of reproduction in animals</li> </ul>	<ul style="list-style-type: none"> <li>• Create a timeline to indicate stages of growth in humans</li> </ul>	<ul style="list-style-type: none"> <li>• Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical &amp; thermal], and response to magnets</li> <li>• Know and explain how a material dissolves to form a solution</li> <li>• Know and show how to recover a substance from a solution</li> <li>• Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating)</li> <li>• Know and demonstrate that some changes are reversible and some are not</li> <li>• Know how some changes result in the formation of a new material and that this is usually irreversible</li> </ul>	<ul style="list-style-type: none"> <li>• Know what gravity is and its impact on our lives</li> <li>• Identify and know the effect of air and water resistance</li> <li>• Identify and know the effect of friction</li> <li>• Explain how levers, pulleys and gears allow a smaller force to have a greater effect</li> </ul>	<ul style="list-style-type: none"> <li>• Know about and explain the movement of the Earth and other planets relative to the Sun</li> <li>• Know about and explain the movement of the Moon relative to the Earth</li> <li>• Know and demonstrate how night and day are created</li> <li>• Describe the Sun, Earth and Moon (using the term spherical)</li> </ul>

# Substantive Knowledge: Year 6

Biology			Physics	
Animals, including humans	All living things and their habitats	Evolution and Inheritance	Electricity	Light
<ul style="list-style-type: none"> <li><i>The circulatory system</i></li> <li><i>Water transportation</i></li> <li><i>Impact of exercise on body</i></li> </ul>	<ul style="list-style-type: none"> <li><i>Classification of living things and the reasons for it</i></li> </ul>	<ul style="list-style-type: none"> <li><i>Identical and non identical off-spring</i></li> <li><i>Fossil evidence and evolution</i></li> <li><i>Adaptation and evolution</i></li> </ul>	<ul style="list-style-type: none"> <li><i>Electrical components</i></li> <li><i>Simple circuits</i></li> <li><i>Fuses and voltage</i></li> </ul>	<ul style="list-style-type: none"> <li><i>How light travels</i></li> <li><i>Reflection</i></li> <li><i>Ray models of light</i></li> </ul>
<ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system</li> <li>Know the function of the heart, blood vessels and blood</li> <li>Know the impact of diet, exercise, drugs and lifestyle on health</li> <li>Know the ways in which nutrients and water are transported in animals, including humans</li> </ul>	<ul style="list-style-type: none"> <li>Classify living things into broad groups according to observable characteristics and based on similarities and differences</li> <li>Know how living things have been classified</li> <li>Give reasons for classifying plants and animals in a specific way</li> </ul>	<ul style="list-style-type: none"> <li>Know how the Earth and living things have changed over time</li> <li>Know how fossils can be used to find out about the past</li> <li>Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents)</li> <li>Know how animals and plants are adapted to suit their environment</li> <li>Link adaptation over time to evolution</li> <li>Know about evolution and can explain what it is</li> </ul>	<ul style="list-style-type: none"> <li>Compare and give reasons for why components work and do not work in a circuit</li> <li>Draw circuit diagrams using correct symbols</li> <li>Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer</li> </ul>	<ul style="list-style-type: none"> <li>Know how light travels</li> <li>Know and demonstrate how we see objects</li> <li>Know why shadows have the same shape as the object that casts them</li> <li>Know how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.</li> </ul>