



**Kessingland Church of England Primary Academy**  
**Writing: Science Curriculum Overview**



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Cycle A -Biology- What makes me me.  Cycle B- Biology- What makes me me.		Biology- Habitats  Biology and physics- What is out there?	Biology- Lifecycles- eggs  Biology- where food comes from	Biology- Lifecycles and seasons  Chemistry and Biology- Water	
YR1	Chemistry- Exploring Everyday Materials	Biology- Animals Including Humans- <b>Animals</b>	Chemistry- Uses of Everyday Materials	Biology-Animals including Humans- <b>About Me</b>	Biology- Introducing Plants	Seasonal Changes
YR2	Chemistry- Uses of Everyday Materials	Biology- Living things and their habitats	Biology- Animals, including Humans- <b>Diet and Health</b>	Biology- Animals, including Humans- <b>Growth</b>	Biology- Plant Growth	Living things and their habitats- Habitats around the world
YR3	Chemistry - Rocks	Biology- Healthy Eating and Skeletons	Physics- Forces and Magnets	Physics- Light and Shadows	Biology- Exploring the world of plants	Biology- Plant life cycles  Working Scientifically experiments
YR4	Chemistry- States of matter	Physics- Electricity	Biology- Teeth and digestion	Physics- Sound	Biology- Animal classification and their habitats	Biology- Nature and the Environment  Working Scientifically experiments
YR5	Chemistry- Properties of Materials	Physics- Forces	Biology- Life cycle of animals and plants	Physics- Space	Biology- Human Life Cycles and Changes	Studying Living things  Working Scientifically Experiments
YR6	Biology- Animals including humans- - Blood and Transportation	Physics- Light	Biology- Evolution and Inheritance	Physics- Electricity	Biology- The Heart and Health	Biology- Living things and Habitats  Working Scientifically Experiments

### **Vision Statement:**

Our vision is that all children leave our school curious and enthusiastic about science having experienced a rich, enquiry-based science curriculum that allows them to learn about the world around them. Children will have the opportunity to learn through a variety of science topics stemming from the scientific disciplines of Biology, Physics and Chemistry, which change each half term. In providing the children with a wide and varied curriculum, we aim to encourage them to challenge their own misconceptions and relate their learning to the wider world. Through offering an engaging and interactive curriculum, we want to instil a love of science in all children and keep the excitement of discovery and enquiry, whilst also inspiring inquisitive minds to form and develop their own scientific questions.

Our teaching of Science is intended to develop the children's subject knowledge in a progressive and steady manner, building upon prior learning and embedded in their lived and shared experiences. As a result of this, the science topics each year group focuses on are mapped out in a way that best utilises the children's learning from the previous academic year and uses the key language and skills that they already know, whilst feeding in the new, more challenging concepts and vocabulary. In doing this, and making the learning 'sticky', the children feel confident and secure in their scientific understanding, allowing for greater progression and development of scientific minds.

Built into the curriculum and fed throughout each of the science lessons, the children also develop their 'working scientifically' skills through a variety of enquiry types. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. We will equip the children with the scientific skills to ask scientific questions about the world, investigate them and interpret their findings. Using the Working Scientifically Skills, and the knowledge acquired throughout their time at our school, the students will be able to explain an occurrence, predict its behaviour and analyse the results.

### **Domains of knowledge:**

Science knowledge falls under 3 core areas- Biology, Physics and Chemistry. Within these three domains, the learning is split into several different topics:

<b>Biology</b>	<b>Physics</b>	<b>Chemistry</b>
Animals, including humans Living things and their habitats Seasonal Changes Plants Evolution and Inheritance	Light Sound Electricity Forces and Magnet Earth and Space	Uses of Everyday Materials States of Matter Properties and changes of materials Rocks

### **Key Concepts:**

We want to enable our students to work in a scientific manner, preparing them for investigations and enquiries. Our key concepts and 'Working Scientifically Skills' are carried on through each year group and are taught within and alongside the domains of knowledge.

These types of scientific concepts include:

Observing over time

Pattern seeking;

Identifying, classifying and grouping

Comparative and fair testing (controlled investigations)

Researching using secondary sources.

Each lesson will include one of these key concepts and working scientifically skills. The progression of these skills are detailed in the table below.

### Working Scientifically Skills

KS1		LKS2		UKS2	
1	2	3	4	5	
Identifying and classifying		Identifying differences, similarities or changes related to simple scientific ideas and processes		Identifying scientific evidence that has been used to support or refute ideas or arguments	
Asking simple questions and recognising that they can be answered in different ways		Asking relevant questions and using different types of scientific enquiries to answer them		Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	
Using their observations and ideas to suggest answers to questions		Using straightforward scientific evidence to answer questions or to support their findings.			
Performing simple tests		Setting up simple practical enquiries, comparative and fair tests			
Observing closely, using simple equipment		Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers		Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	
Gathering and recording data to help in answering questions		Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions		Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables,	

	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	scatter graphs, bar and line graphs
	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	Using test results to make predictions to set up further comparative and fair tests:
	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations

### **End point 1: Scientific Knowledge- Biology**

Students are able to develop their Scientific knowledge and conceptual understanding of the discipline of Biology. By the end of KS2, they will be able to describe and explain the key functions and parts of the body in humans and animals and how external inputs can affect these functions; observe and interpret the animal kingdom and food chains; identify, describe and explain the features and process involved in plant growth and their life cycles; and to describe and explain inheritance and evolution .

<b>National Curriculum Link:</b>			
<b>Animals, Including Humans</b>	<b>Living things and their Habitats</b>	<b>Plants</b>	<b>Evolution and Inheritance</b>
<ul style="list-style-type: none"> <li>To name and describe the functions of the main parts of the digestive (year 4), musculoskeletal (year 3) and circulatory systems (year 6); and describe and compare different reproductive processes and life cycles in animals (year 5)</li> <li>To describe the effects of diet, exercise, drugs and lifestyle on how the body functions (year 6)</li> </ul>	<ul style="list-style-type: none"> <li>To use the observable features of plants, animals and microorganisms to group, classify and identify them into broad groups, using keys or other methods (year 6)</li> <li>To construct and interpret food chains (year 4)</li> </ul>	<ul style="list-style-type: none"> <li>To name, locate and describe the functions of the main parts of plants, including those involved in reproduction (year 5) and transporting water and nutrients (year 3)</li> <li>To describe the requirements of plants for life and growth (year 3); and explain how environmental changes may have an impact on living things (year 4)</li> </ul>	<ul style="list-style-type: none"> <li>To use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved (year 6); and describe how fossils are formed (year 3) and provide evidence for evolution (year 6)</li> </ul>

## End point 2: Physics

Students are able to develop their Scientific knowledge and conceptual understanding of the discipline of Physics. By the end of KS2, they will be able to use and explain how light travels and creates shadows; describe and explain sound, including pitch and volume; create and use an electrical circuit; describe the effects of forces; identify mechanisms; and, describe the movement of the Sun, Moon and Earth and other planets in our solar system.

<b>National Curriculum Link:</b>				
<b>Light</b>	<b>Sound</b>	<b>Electricity</b>	<b>Forces and Magnets</b>	<b>Earth and Space</b>
<ul style="list-style-type: none"> <li>To use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects (year 6), and the formation (year 3), shape (year 6) and size of shadows (year 3).</li> </ul>	<ul style="list-style-type: none"> <li>To use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard (year 4).</li> <li>To describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source (year 4).</li> </ul>	<ul style="list-style-type: none"> <li>To use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams (year 6)</li> </ul>	<ul style="list-style-type: none"> <li>To describe the effects of simple forces that involve contact (air and water resistance, friction) (year 5), that act at a distance (magnetic forces, including those between like and unlike magnetic poles) (year 3), and gravity (year 5)</li> <li>To identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force (year 5)</li> </ul>	<ul style="list-style-type: none"> <li>To describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night (year 5).</li> </ul>

## End Point 3: Chemistry

Students are able to develop their Scientific knowledge and conceptual understanding of the discipline of Chemistry. By the end of KS2, they will be able to group and identify materials based on their properties, describe the changes in state that can happen to different materials; and to identify and describe reversible and irreversible changes.

<b>National Curriculum Link:</b>			
<b>Uses of Everyday Materials</b>	<b>States of Matter</b>	<b>Properties and Changes of Materials</b>	<b>Rocks</b>

<ul style="list-style-type: none"> <li>• To group and identify materials (year 5), including rocks (year 3), in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties (year 5).</li> </ul>	<ul style="list-style-type: none"> <li>• To describe the characteristics of different states of matter and group materials on this basis; and describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle (year 4).</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• To identify and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components (year 5).</li> <li>• To identify, with reasons, whether changes in materials are reversible or not (year 5).</li> </ul>	<ul style="list-style-type: none"> <li>• To group and identify rocks.</li> <li>• To describe how fossils are formed.</li> </ul>
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#### **End Point 4: Working scientifically skills**

Through a range of enquiry types linked to our core concepts, and running alongside the domains of knowledge, children will be able to ask their own questions and use systematic and scientific skills to investigate these. By the end of KS2 the skills the students will be able to are:

- To describe and evaluate their own and others' scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources.
- To ask their own questions about the scientific phenomena that they are studying, and select the most appropriate ways to answer these questions, recognising and controlling variables where necessary (i.e. observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources).
- To use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate.
- To record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- To draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways.
- To raise further questions that could be investigated, based on their data and observations.