

# Curriculum Skills and Progression Science: 2023 to 2024



Nebula  
where stars are born



## The Science Curriculum and Christian Distinctiveness at Horsford CofE VA Primary School

At Horsford Primary School, we encourage our children to embrace our Christian Distinctiveness and school's Key Values: compassion, courage and responsibility. Our rich and varied Science curriculum encourages pupils to explore, challenge and wonder at the world around them. At our school, children are given varied opportunities to observe closely and have the courage to question the world around them. We instil a school ethos whereby our children have the courage to embrace challenge and risk to deepen their scientific knowledge. Our school community fosters caring for each other whilst engaging with challenging ideas, listening to the views of others and sharing our own in a safe, respectful and supportive environment. Children will gain a sense of responsibility towards caring for our planet through the exploration of the science behind our natural world. Whilst the discovery of new knowledge is integral within our science curriculum, we also promote an awareness that this knowledge cannot stand alone and should be used for the benefit of ourselves and others. As the good Samaritan demonstrated when he cared for not only the individual but also the communities around him.

**'Spirituality is the bitter-sweet yearning for beauty, truth, love and wonder beyond ourselves. It is a longing we pursue together and a treasure we glimpse in ourselves and one another and seek beyond us into eternity. It is life in all its fullness.'**





## The Science Curriculum and Provision for Pupils with SEND

At Horsford C of E VA Primary school, we believe all pupils should have the opportunity to learn to the best of their capabilities through a broad and balanced, inclusive curriculum. For our pupils with a Special Educational Need, we scaffold their learning to provide them with the strongest opportunities for success in our school. We believe firmly in the SEND Code of Practice's statement that 'every teacher is a teacher of SEN' and that our pupils with SEN should be provided with the same opportunities as their peers in our school. This means that, with their learning being personalised to meet their areas of need, they feel included in the classroom and make progress year on year. Reasonable adjustments are made in all lessons to enable this.

The Science curriculum can be adapted to meet the needs of children with SEND in the following ways.

Word Banks for pre-learning and to support during topics and themes	Writing frames and scaffolding
Print out portions of work and learning objectives to minimise writing	Close to adult support where possible and appropriate.
Breaking down lessons into short, manageable chunks	Visual and Picture aids
Mixed ability groups – using peers as support and role models	Allow talk time for those who find recording difficult
Using another student as a reader/support	Keeping instructions short and one at a time
Draw answers or explanations	Equipment adapted for needs (books, scissors, pencils, whiteboard)
Use of a scribe where appropriate	Recording devices to record their answers/sentences – talking tins, iPad

When planning for Science class teachers should adapt their lessons where necessary using ideas taken from this list, however it is important to remember this list is not exhaustive and other adaptations may be needed for children with specific needs.

## Science- EYFS

### Understanding the World

**EYFS Statutory Educational Programme:** Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

### **Natural World ELG**

- 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.

## Vocabulary

Animals  
Changes  
Describe  
Different  
Environment  
Investigate  
Observation  
Plants  
Seasons  
Senses  
Similar  
Sort  
Test

## Inquiry

Science is covered throughout the year through weekly themes taken from the interests of the children. A weekly hook sheet is published and scientific work can be identified on it. Weekly enhanced provision is planned to ensure the children have the opportunity to explore science skills independently throughout the week.

## Early Years – Working Scientifically

### Reception Statements

- Explore the natural world around them.
- Describe what they see, hear and feel whilst outside.
- Recognise some environments that are different to the one in which they live.
- Understand the effect of changing seasons on the natural world around them.

Observing closely	Performing Tests	Identifying and Classifying	Recording findings
<ul style="list-style-type: none"> <li>• Discuss what they can see, touch, smell, hear or taste?</li> <li>• Use simple equipment to help them make observations.</li> <li>• Talk about changes with the seasons.</li> </ul>	<ul style="list-style-type: none"> <li>• Perform a simple test?</li> <li>• Describe/ explain what they have done?</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and classify things they observe?</li> <li>• Think of some questions to ask?</li> <li>• Answer some scientific questions?</li> <li>• Give a simple reason for their answer?</li> <li>• Explain what they have found out?</li> <li>• Talk about how environments are different and similar</li> </ul>	<ul style="list-style-type: none"> <li>• Show their work using pictures, labels and captions?</li> <li>• Record their findings.</li> <li>• Record some information in a chart or table, or using ICT</li> </ul>

### Early Years Greater Depth

<ul style="list-style-type: none"> <li>• Can they find out by watching, listening, tasting, smelling and touching?</li> <li>• Can they give reasons for their answers?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they give reasons for their answers?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they discuss similarities and differences?</li> <li>• Can they explain what they have found out using scientific vocabulary?</li> <li>• Can they give reasons for their answers?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they compare measurements?</li> <li>• Can they give reasons for their answers?</li> </ul>
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**Skills Map – Science  
Year 1**

<b>Plants</b>	<b>Animals, including Humans</b>	
<ul style="list-style-type: none"> <li>● Can they describe and name the petals, stem, leaf, bulb, flower, seed, stem and root of a plant?</li> <li>● Can they identify and name a range of common plants and trees?</li> <li>● Can they name the trunk, branches and root of a tree?</li> <li>● Can they discuss what they can see, touch, smell, hear or taste?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they identify some of the differences between different animals?</li> <li>● Can they identify living and non-living things?</li> <li>● Can they identify and name a variety of common animals?</li> <li>● Can they describe how an animal is suited to its environment?</li> <li>● Can they identify and name a variety of common animals that are carnivores, herbivores and omnivores?</li> <li>● Can they explain what they have found out?</li> <li>● Can they give a simple reason for their answers?</li> <li>● Can they discuss what they can see, touch, smell, hear or taste?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they name the parts of the human body and link them to their senses?</li> <li>● Can they name the parts of an animal's body?</li> <li>● Can they name a range of domestic animals?</li> <li>● Can they compare the bodies of different animals?</li> <li>● Can they identify things they observe?</li> <li>● Can they give a simple reason for their answers?</li> <li>● Can they talk about what they see, touch, smell, hear or taste?</li> </ul>
<b>Year 1 Greater Depth</b>		
<ul style="list-style-type: none"> <li>● Can they begin to describe what each part of a plant does? (e.g. roots, stem, leaves, petals, pollen) on a range of plants.</li> </ul>	<ul style="list-style-type: none"> <li>● Can they begin to classify animals according to a number of given criteria?</li> <li>● Can they point out differences between living and non-living things?</li> </ul>	<p>Can they name some parts of the human body that cannot be seen?</p> <ul style="list-style-type: none"> <li>● Can they say why certain animals have certain characteristics?</li> <li>● Can they name a range of wild animals?</li> </ul>

Cycle 1 is indicated in blue. Cycle 2 is indicated in pink. Objectives in black can be covered across both cycles.

**Skills Map - Science  
Year 1**

**Everyday Materials and Seasonal Changes**

**CYCLE 1 & 2- Every day materials (classifying and grouping)**

**CYCLE 1 & 2- Seasonal Changes**

- Can they distinguish between an object and the material from which it is made?
- Can they describe materials using their senses, using specific scientific words?
- Can they explain what material objects are made from?
- Can they explain why a material might be useful for a specific job?
- Can they name some different everyday materials? e.g. wood, plastic, metal, water and rock
- Can they sort materials into groups by a given criteria?
- Can they explain how solid shapes can be changed by squashing, bending, twisting and stretching?
- Can they perform a simple test?
- Can they tell other people about what they have done?
- Can they talk about what they see, touch, smell, hear or taste?
- Can they use simple equipment to help them make observations?
- Can they identify and classify things they observe?

- Can they observe changes across the four seasons?
- Can they name the four seasons in order?
- Can they observe and describe weather associated with the seasons?
- Can they observe and describe how day length varies?
- Can they talk about what they: see, touch, smell, hear or taste?
- Can they use simple equipment to help them make observations?

**Year 1 Greater Depth**

- Can they describe things that are similar and different between materials?
- Can they explain what happens to certain materials when they are heated, e.g. bread, ice, chocolate?
- Can they explain what happens to certain materials when they are cooled, e.g. jelly, heated chocolate?

- Can they observe features in the environment and explain that these are related to a specific season?
- Can they observe and talk about changes in the weather?
- Can they talk about weather variation in different parts of the world?

Cycle 1 is indicated in blue. Cycle 2 is indicated in pink. Objectives in black can be covered across both cycles.

## Skills Map – Science

### Year 1

#### Working Scientifically

Observing closely	Performing Tests	Identifying and Classifying	Recording findings
<ul style="list-style-type: none"><li>• Can they discuss what they can see, touch, smell, hear or taste?</li><li>• Can they use simple equipment to help them make observations?</li></ul>	<ul style="list-style-type: none"><li>• Can they perform a simple test?</li><li>• Can they describe/ explain what they have done?</li></ul>	<ul style="list-style-type: none"><li>• Can they identify and classify things they observe?</li><li>• Can they think of some questions to ask?</li><li>• Can they answer some scientific questions?</li><li>• Can they give a simple reason for their answer?</li><li>• Can they explain what they have found out?</li></ul>	<ul style="list-style-type: none"><li>• Can they show their work using pictures, labels and captions?</li><li>• Can they record their findings using standard units?</li><li>• Can they record some information in a chart or table, or using ICT?</li></ul>

#### Year 1 Greater Depth

<ul style="list-style-type: none"><li>• Can they find out by watching, listening, tasting, smelling and touching?</li></ul>	<ul style="list-style-type: none"><li>• Can they give reasons for their answers?</li></ul>	<ul style="list-style-type: none"><li>• Can they discuss similarities and differences?</li><li>• Can they explain what they have found out using scientific vocabulary?</li></ul>	<ul style="list-style-type: none"><li>• Can they make accurate measurements using non-standard measurements i.e. unifix</li></ul>
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## Skills Map – Science

### Year 2

#### Living things and their Habitats, Animals including Humans and Plants

CYCLE 1 & 2 - Living things and their Habitats	CYCLE 1 & 2 - Animals, including Humans	CYCLE 1 & 2 - Plants
<ul style="list-style-type: none"> <li>● Can they match certain living things to the habitats they are found in?</li> <li>● Can they explain the differences between living and non-living things?</li> <li>● Can they describe some of the life processes common to plants and animals, including humans?</li> <li>● Can they describe how a habitat provides for the basic needs of things living there?</li> <li>● Can they describe how some animals get their food using basic food chains?</li> <li>● Can they describe how plants and animals are suited to their habitat?</li> <li>● Find things out using secondary sources of information.</li> <li>● Can they organise things into groups?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they describe what animals need to survive?</li> <li>● Can they explain that animals grow and reproduce?</li> <li>● Can they explain why animals have offspring which grow into adults?</li> <li>● Can they describe the life cycle of some living things? (e.g. egg, chick, chicken)</li> <li>● Can they explain the basic needs of animals, including humans for survival? (water, food, air)</li> <li>● Can they describe why exercise, balanced diet and hygiene are important for humans?</li> <li>● Can they suggest how to find things out?</li> <li>● Can they use prompts to find things out?</li> <li>● Finding things out using secondary sources of information</li> </ul>	<ul style="list-style-type: none"> <li>● Can they describe what plants need to survive?</li> <li>● Can they observe and describe how seeds and bulbs grow into mature plants?</li> <li>● Can they investigate and describe the impact of removing light, soil or water from a growing or germinating plant.</li> <li>● Observing changes over time.</li> <li>● Can they suggest how to find things out?</li> <li>● Can they use prompts to find things out?</li> </ul>
Year 2 Greater Depth		
<ul style="list-style-type: none"> <li>● Can they name some characteristics of an animal that help it to live in a particular habitat?</li> <li>● Can they describe what animals need to survive and link this to their habitats?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they explain that animals reproduce in different ways?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they describe what plants need to survive and link it to where they are found?</li> <li>● Can they explain that plants grow and reproduce in different ways?</li> </ul>

Cycle 1 is indicated in blue. Cycle 2 is indicated in pink. Objectives in black can be covered across both cycles.

## Skills Map – Science

### Year 2

#### Materials

##### CYCLE 1 & 2 - Classifying and grouping materials

##### CYCLE 1 & 2 - Changing materials

- Can they describe the simple physical properties of a variety of everyday materials?
- Can they compare and group together a variety of materials based on their simple physical properties?
- Can they use - see, touch, smell, hear or taste - to help them answer questions?
- Can they use some scientific words to describe what they have seen and measured?

- Can they explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching)
- Can they identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses?
- Can they organise things into groups?
- Can they say whether things happened as they expected?

#### Year 2 Greater Depth

- Can they describe the properties of different materials using words like, transparent or opaque, flexible, etc.?
- Can they sort materials into groups and say why they have sorted them in that way?
- Can they say which materials are natural and which are man-made?

- Can they explain how materials are changed by heating and cooling?
- Can they explain how materials are changed by bending, twisting and stretching?
- Can they tell which materials cannot be changed back after being heated, cooled, bent, stretched or twisted?

## Skills Map - Science

### Year 2

#### Working Scientifically

Observing closely	Performing Tests	Identifying and Classifying	Recording findings	Types of investigations
<ul style="list-style-type: none"> <li>● Can they use - see, touch, smell, hear or taste to help them answer questions?</li> <li>● Can they use some scientific words to describe what they have seen and measured?</li> <li>● Can they compare several things?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they carry out a simple fair test?</li> <li>● Can they explain why it might not be fair to compare two things?</li> <li>● Can they say whether things happened as they expected?</li> <li>● Can they suggest how to find things out?</li> <li>● Can they use prompts to find things out?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they organise things into groups?</li> <li>● Can they find simple patterns (or associations)?</li> <li>● Can they identify animals and plants by a specific criteria, e.g. lay eggs or not; have feathers or not?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they use text, diagrams, pictures, charts, tables to record their observations?</li> <li>● Can they measure using simple equipment?</li> </ul>	<ul style="list-style-type: none"> <li>● Children should have the opportunity to investigate:</li> <li>● Observing changes over time</li> <li>● Noticing similarities, differences and patterns.</li> <li>● Grouping and classifying.</li> <li>● Carrying our comparative tests.</li> <li>● Finding things out using secondary sources of information.</li> </ul>

#### Year 2 Greater Depth

<ul style="list-style-type: none"> <li>● Can they suggest ways of finding out through listening, hearing, smelling, touching and tasting?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they say whether things happened as they expected and if not why not?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they suggest more than one way of grouping animals and plants and explain their reasons?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they use information from books and online information to find things out?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they begin to independently consider controlling variables to create a fair test?</li> </ul>
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## Skills Map – Science

### Year 3

#### Plants and Animals, including Humans

##### Animals, including Humans

- Can they explain the importance of a nutritionally balanced diet?
- Can they describe how nutrients, water and oxygen are transported within animals and humans?
- Can they identify that animals, including humans, cannot make their own food: they get nutrition from what they eat?
- Can they describe and explain the skeletal system of a human?
- Can they describe and explain the muscular system of a human?
- Can they describe what they have found using scientific language?
- Can they describe what they have found out using secondary sources?

##### Plants

- Can they identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)? Range of plants.
- Can they explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)?
- Can they investigate the way in which water is transported within plants?
- Can they explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal?
- Can they record their observations in different ways? (Labelled diagrams, charts etc.) Use secondary sources
- Can they plan and set up a fair test and explain why it was fair?
- Can they explain what they have found out and use their measurements to say whether it helps to answer their question?
- Can they set up a simple test to make comparisons?

##### Writing Opportunities – Non-chronological reports, Explanations

*Plant fact files, Explaining the pollination process, Finding out how nature regenerates*

#### Year 3 Greater Depth

- Can they explain how the muscular and skeletal systems work together to create movement?
- Can they classify living things and non-living things by a number of characteristics that they have thought of?
- Can they explain how people, weather and the environment can affect living things?
- Can they explain how certain living things depend on one another to survive?

- Can they classify a range of common plants according to many criteria (environment found, size, climate required, etc.)?

Cycle 1 is indicated in blue. Cycle 2 is indicated in pink. Objectives in black can be covered across both cycles.

**Skills Map – Science  
Year 3**

**Rocks, Forces and Magnets, Light**

<b>Rocks</b>	<b>Forces and Magnets</b>	<b>Light</b>
<ul style="list-style-type: none"> <li>● Can they compare and group together different rocks on the basis of their appearance and simple physical properties?</li> <li>● Can they describe and explain how different rocks can be useful to us?</li> <li>● Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock?</li> <li>● Can they describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed?</li> <li>● Can they recognise that soils are made from rocks and organic matter?</li> <li>● Can they describe what they have found using scientific language?</li> <li>● Can they classify objects in different ways?</li> <li>● Can they describe what they have found using scientific language?</li> <li>● Can they use different ideas and suggest how to find something out?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they compare how things move on different surfaces?</li> <li>● Can they observe that magnetic forces can be transmitted without direct contact?</li> <li>● Can they observe how some magnets attract or repel each other?</li> <li>● Can they identify and classify which everyday materials are attracted to magnets and which are not?</li> <li>● Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance?</li> <li>● Can they describe magnets have having two poles (N &amp; S) and predict whether two magnets will attract or repel each other depending on which poles are facing?</li> <li>● Can they make and record a prediction before testing?</li> <li>● Can they take accurate measurements using different equipment and units of measure?</li> <li>● Can they set up a simple fair test to make comparisons?</li> <li>● Can they explain what they have found out and use their measurements to say whether it helps to answer their question?</li> <li>● Can they record their observations in different ways? - labelled diagrams, charts etc.?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they recognise that they need light in order to see things?</li> <li>● Can they recognise that dark is the absence of light?</li> <li>● Can they notice that light is reflected from surfaces?</li> <li>● Can they recognise that light from the sun can be dangerous and that there are ways to protect their eyes?</li> <li>● Can they recognise that shadows are formed when the light from a light source is blocked by a solid object?</li> <li>● Can they find patterns in the way that the size of shadows change?</li> <li>● Can they explain the difference between transparent, translucent and opaque?</li> <li>● Can they set up a simple fair test to make comparisons?</li> <li>● Can they describe what they have found using scientific language?</li> <li>● Can they record their observations in different ways? - labelled diagrams, charts etc.</li> </ul>
<b>Year 3 Greater Depth</b>		
<ul style="list-style-type: none"> <li>● Can they classify igneous and sedimentary rocks?</li> <li>● Can they begin to relate the properties of rocks with their uses?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they investigate the strengths of different magnets and find fair ways to compare them?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they explain why lights need to be bright or dimmer according to need?</li> <li>● Can they say what happens to the electricity when more batteries are added?</li> <li>● Can they explain why their shadow changes when the light source is moved closer or further from the object?</li> </ul>

Cycle 1 is indicated in in blue. Cycle 2 is indicated in pink. Objectives in black can be covered across both cycles.

## Skills Map – Science

### Year 3

#### Working Scientifically

Planning	Obtaining and presenting evidence	Considering evidence and evaluating	Types of investigations
<ul style="list-style-type: none"> <li>● Can they use different ideas and suggest how to find something out?</li> <li>● Can they make and record a prediction before testing?</li> <li>● Can they plan a fair test and explain why it was fair?</li> <li>● Can they set up a simple fair test to make comparisons?</li> <li>● Can they explain why they need to collect information to answer a question?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they take accurate measurements using different equipment and units of measure?</li> <li>● Can they record their observations in different ways? - labelled diagrams, charts etc.</li> <li>● Can they describe what they have found using scientific language?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they explain what they have found out and use their measurements to say whether it helps to answer their question?</li> </ul>	<ul style="list-style-type: none"> <li>● Children should have the opportunity to investigate</li> <li>● Observing changes over different periods of time</li> <li>● Noticing patterns</li> <li>● Grouping and classifying</li> <li>● Carrying out comparative and fair tests</li> <li>● Finding things out using secondary resources</li> </ul>

#### Year 3 Greater Depth

<ul style="list-style-type: none"> <li>● Can they record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they explain their findings in different ways (display, presentation, and writing)?</li> <li>● Can they use their findings to draw a simple conclusion?</li> <li>● Can they suggest improvements and predictions for further tests?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they suggest how to improve their work if they did it again?</li> </ul>	
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**Skills Map – Science  
Year 4**

**Living Things and their Habitats, Animals including Humans and States of Matter**

<b>Animals including Humans</b>	<b>Living Things and their Habitats</b>	<b>States of Matter</b>
<ul style="list-style-type: none"> <li>● Can they identify, name and describe the functions of the basic parts of the digestive system in humans?</li> <li>● Can they identify the simple function of different types of teeth in humans?</li> <li>● Can they compare the teeth of herbivores and carnivores?</li> <li>● <b>Can they identify, construct and interpret a variety of food chains, identifying producers, predators and prey?</b></li> <li>● Can they identify differences, similarities or changes related to simple scientific ideas or processes?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they recognise that living things can be grouped in a variety of ways?</li> <li>● Can they classify and identify into broad groups?</li> <li>● Can they explore and use a classification key to group, identify and name a variety of living things? (plants, vertebrates, invertebrates)</li> <li>● Do they recognise that environments can change and this can sometimes pose a danger to living things?</li> <li>● <b>Can they explain how environmental changes have an impact on living things?</b></li> <li>● Can they record data using diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs?</li> <li>● Can they explain their findings in different ways (display, presentation, writing)?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they compare and group materials together, according to whether they are solids, liquids or gases?</li> <li>● Can they explain what happens to materials when they are heated or cooled?</li> <li>● Can they measure or research the temperature at which different materials change state in degrees Celsius?</li> <li>● Can they describe how materials change state at different temperatures?</li> <li>● Can they use measurements to explain changes to the state of water?</li> <li>● <b>Can they explain everyday phenomena including the water cycle?</b></li> <li>● Can they record data using diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs?</li> <li>● Can they evaluate and communicate their methods and findings?</li> <li>● Can they use a range scientific equipment to take accurate measurements or readings?</li> </ul>
<b>Year 4 Greater Depth</b>		
<ul style="list-style-type: none"> <li>● Can they classify living things and non-living things by a number of characteristics that they have thought of?</li> <li>● Can they explain how people, weather and the environment can affect living things?</li> <li>● Can they explain how certain living things depend on one another to survive?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they give reasons for how they have classified animals and plants, using their characteristics and how they are suited to their environment?</li> <li>● Can they explore the work of pioneers in classification? (e.g. Carl Linnaeus)</li> <li>● Can they name and group a variety of living things based on feeding patterns? (producer, consumer, predator, prey, herbivore, carnivore, omnivore).</li> </ul>	<ul style="list-style-type: none"> <li>● Can they group and classify a variety of materials according to the impact of temperature on them?</li> <li>● Can they explain what happens over time to materials such as puddles on the playground or washing hanging on a line?</li> </ul>

**Cycle 1 is indicated in blue. Cycle 2 is indicated in pink. Objectives in black can be covered across both cycles.**

**Skills Map – Science  
Year 4**

**Sound and Electricity**

Sound	Electricity
<ul style="list-style-type: none"> <li>● Can they describe a range of sounds and explain how they are made?</li> <li>● Can they associate some sounds with something vibrating?</li> <li>● Can they compare sources of sound and explain how the sounds differ?</li> <li>● Can they explain how to change a sound (louder/softer)?</li> <li>● Can they recognise how vibrations from sound travel through a medium to an ear?</li> <li>● Can they describe the relationship between the pitch of the sound and the features of its source/object that produces it?</li> <li>● Can they find patterns between the volume of the sound and the strength of the vibrations that produced it, and the distance of the source?</li> <li>● Can they investigate how different materials can affect the pitch and volume of sounds?</li> <li>● Can they plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated?</li> <li>● Can they decide which information needs to be collected and decide the best way for collecting it?</li> <li>● Can they evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they identify common appliances that run on electricity?</li> <li>● Can they construct a simple series electric circuit?</li> <li>● Can they identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers?</li> <li>● Can they recognise symbols to represent simple series circuit diagrams?</li> <li>● Can they 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?</li> <li>● Can they recognise that a switch opens and closes a circuit?</li> <li>● Can they associate a switch opening with whether or not a lamp lights in a simple series circuit?</li> <li>● Can they recognise some common conductors and insulators?</li> <li>● Can they associate metals with being good conductors?</li> <li>● Can they plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated?</li> <li>● Can they suggest improvements and predictions?</li> <li>● Can they ask their own questions?</li> <li>● Can they explain their findings in different ways (display, presentation, writing)?</li> </ul>
Year 4 Greater Depth	
<ul style="list-style-type: none"> <li>● Can they explain why sound gets fainter or louder according to the distance?</li> <li>● Can they explain how pitch and volume can be changed in a variety of ways?</li> <li>● Can they work out which materials give the best insulation for sound?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they explain how a bulb might get lighter?</li> <li>● Can they recognise if all metals are conductors of electricity?</li> <li>● Can they work out which metals can be used to connect across a gap in a circuit?</li> <li>● Can they explain why cautions are necessary for working safely with electricity?</li> </ul>

Cycle 1 is indicated in blue. Cycle 2 is indicated in pink. Objectives in black can be covered across both cycles.



## Skills Map – Science

### Year 4

#### Working Scientifically

Planning	Obtaining and presenting evidence	Considering evidence and evaluating	Types of investigations
<ul style="list-style-type: none"> <li>● Can they plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated?</li> <li>● Can they suggest improvements and predictions?</li> <li>● Can they ask their own questions?</li> <li>● Can they decide which information needs to be collected and decide what the best way to collect it is?</li> <li>● Can they use their findings to draw a simple conclusion?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they take measurements using different equipment and units of measure and record what they have found in a range of ways?</li> <li>● Can they use a range scientific equipment's to take accurate measurements or readings?</li> <li>● Can they explain their findings in different ways (display, presentation, writing)?</li> <li>● Can they record data using diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they find any patterns in their evidence or measurements?</li> <li>● Can they evaluate and communicate their methods and findings?</li> <li>● Can they make a prediction based on something they have found out?</li> <li>● Can they ask further questions based on their data and observations?</li> <li>● Can they evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?</li> <li>● Can they identify differences, similarities or changes related to simple scientific ideas or processes?</li> </ul>	<p>Children should have the opportunity to investigate:</p> <ul style="list-style-type: none"> <li>● Observing changes over different periods of time</li> <li>● Noticing patterns</li> <li>● Grouping and classifying</li> <li>● Carrying out comparative and fair tests</li> <li>● Finding things out using secondary resources.</li> </ul>

#### Year 4 Greater Depth

<ul style="list-style-type: none"> <li>● Can they plan and carry out an investigation by controlling variables fairly and accurately?</li> <li>● Can they use test results to make further predictions and set up further comparative tests?</li> </ul>	<p>Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?</p>	<ul style="list-style-type: none"> <li>● Can they report findings from investigations through written explanations and conclusions?</li> <li>● Can they use a graph or diagram to answer scientific questions?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they use a range of variables to investigate?</li> </ul>
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## Skills Map – Science Year 5

### Living Things and their Habitats, Properties and changes to materials

Animals including Humans	Living Things and their Habitats	Properties and changes to materials
<ul style="list-style-type: none"> <li>● Can they describe the changes as humans develop to old age?</li> <li>● Can they use basic ideas of inheritance, variation and adaptation to describe how living things have changed over time?</li> <li>● Can they use a graph to answer scientific questions?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they describe the differences in the life cycles of a mammal, amphibians, an insects and a bird?</li> <li>● Can they identify the reproductive processes of some animals?</li> <li>● Can they describe the life cycles of common plants?</li> <li>● Can they present a report of their findings through writing, display presentation?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets?</li> <li>● Can they explain how some materials dissolve in liquid to form a solution?</li> <li>● Can they explain what happens when dissolving occurs?</li> <li>● Can they use their knowledge of solids, liquids and gases to decide and describe how mixtures might be separated, including through filtering, sieving, evaporating?</li> <li>● Can they give reasons, based on evidence for comparative and fair tests for the particular uses of everyday materials, including metals wood and plastic?</li> <li>● Can they demonstrate that dissolving, mixing and changes of state are reversible changes? Can they 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?</li> <li>● Can they use the terms 'reversible' and 'irreversible'?</li> <li>● Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary?</li> <li>● Can they make a prediction with reasons?</li> <li>● Can they use test results to make predictions to set up comparative and fair tests?</li> <li>● Can they take repeat readings when appropriate?</li> <li>● Can they record more complex data and results using scientific diagrams, labels, classification keys, table, scatter graphs, bar or line graphs?</li> <li>● Can they describe changes using scientific words? (evaporation, condensation)</li> </ul>
Year 5 Greater Depth		
<ul style="list-style-type: none"> <li>● Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies?</li> <li>● Can they describe the changes experienced in puberty?</li> <li>● Can they draw a timeline to indicate stages in the growth and development of humans?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border?</li> <li>● Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they describe methods for separating mixtures? (filtration, distillation)</li> <li>● Can they work out which materials are most effective for keeping us warm or for keeping something cold?</li> <li>● Can they use their knowledge of materials to suggest ways to classify? (solids, liquids, gases)</li> <li>● Can they explore changes that are difficult to reverse, e.g. burning, rusting and reactions such as vinegar with bicarbonate of soda?</li> <li>● Can they explore the work of chemists who created new materials, e.g. Spencer Silver (glue on sticky notes) or Ruth Benerito (wrinkle free cotton)?</li> </ul>

**Skills Map – Science  
Year 5**

**Earth, Space and Forces**

<b>Earth and Space</b>	<b>Forces</b>
<ul style="list-style-type: none"> <li>● Can they identify and explain the movement of the Earth and other planets relative to the sun in the solar system?</li> <li>● Can they explain the seasons</li> <li>● Can they describe and explain the movement of the Moon relative to the Earth?</li> <li>● Can they describe the sun, earth and moon as approximately spherical bodies?</li> <li>● Can they use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky?</li> <li>● Can they present a report of their findings through writing, display and presentation using appropriate scientific vocabulary?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object?</li> <li>● Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces?</li> <li>● Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect?</li> <li>● Can they present a report of their findings using appropriate scientific vocabulary?</li> <li>● Can they use a graph to answer scientific questions?</li> <li>● Can they use test results to make predictions to set up comparative and fair tests?</li> </ul>
<b>Year 5 Greater Depth</b>	
<ul style="list-style-type: none"> <li>● Can they compare the time of day at different places on the earth?</li> <li>● Can they create shadow clocks?</li> <li>● Can they begin to understand how older civilizations used the sun to create astronomical clocks, e.g. Stonehenge?</li> <li>● Can they explore the work of some scientists? (Ptolemy, Alhazen, Copernicus)</li> </ul>	<ul style="list-style-type: none"> <li>● Can they describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction)</li> <li>● Can they design very effective parachutes?</li> <li>● Can they work out how water can cause resistance to floating objects?</li> <li>● Can they explore how scientists, such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation?</li> </ul>

Cycle 1 is indicated in blue. Cycle 2 is indicated in pink. Objectives in black can be covered across both cycles.

**Skills Map – Science  
Year 5**

**Working Scientifically**

<b>Planning</b>	<b>Obtaining and presenting evidence</b>	<b>Considering evidence and evaluating</b>
<ul style="list-style-type: none"> <li>● Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary?</li> <li>● Can they make a prediction with reasons?</li> <li>● Can they use test results to make predictions to set up comparative and fair tests?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they take measurements using a range of scientific equipment with increasing accuracy and precision?</li> <li>● Can they take repeat readings when appropriate?</li> <li>● Can they record more complex data and results using scientific diagrams, labels, classification keys, table, scatter graphs, bar and line graphs?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they use a graph to answer scientific questions?</li> <li>● Can they present a report of their findings through writing, display and presentation?</li> </ul>

**Year 5 Greater Depth**

<ul style="list-style-type: none"> <li>● Can they explore different ways to test an idea, choose the best way and give reasons?</li> <li>● Can they vary one factor whilst keeping the others the same in an experiment?</li> <li>● Can they use information to help make a prediction?</li> <li>● Can they explain, in simple terms, a scientific idea and what evidence supports it?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they decide which units of measurement they need to use?</li> <li>● Can they explain why a measurement needs to be repeated?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they find a pattern from their data and explain what it shows?</li> <li>● Can they link what they have found out to other science?</li> <li>● Can they suggest how to improve their work and say why they think this?</li> </ul>
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## Skills Map – Science

### Year 6

#### Living Things

Evolution and Inheritance	Living things and their Habitats	Animals, including Humans
<ul style="list-style-type: none"> <li>● Can they recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago?</li> <li>● Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents?</li> <li>● Can they give reasons why offspring are not identical to each other or to their parents?</li> <li>● Can they explain the process of evolution and describe the evidence for this?</li> <li>● Can they identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they 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?</li> <li>● Can they give reasons for classifying plants and animals based on specific characteristics?</li> <li>● Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs or models?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood?</li> <li>● Can they recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function?</li> <li>● Can they describe the ways in which nutrients and water are transported within animals and plants, including humans?</li> </ul>
Year 6 Greater Depth		
<ul style="list-style-type: none"> <li>● Can they research and discuss the work of famous scientists, such as Charles Darwin, Mary Anning or Alfred Wallace?</li> <li>● Can they explain how some living things adapt to survive in extreme conditions?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they explain why classification is important?</li> <li>● Can they readily group animals into reptiles, fish, amphibians, birds and mammals?</li> <li>● Can they sub divide their original groupings and explain their divisions, such as vertebrates and invertebrates?</li> <li>● Can they find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they compare the organ systems of humans to other animals?</li> <li>● Can they make a diagram of the human body and explain how different parts work and depend on one another?</li> <li>● Can they name and locate the major organs in the human body?</li> </ul>

Cycle 1 is indicated in in blue. Cycle 2 is indicated in pink. Objectives in black can be covered across both cycles.

**Skills Map – Science  
Year 6**

**Electricity and Light**

**Electricity**

**Light**

- Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers)
- Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches?
- Can they use recognised symbols when representing a simple circuit in a diagram?
- Can they identify the key factors when planning a fair test?
- Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this?
- Can they use information to make a prediction and give reasons for it?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they suggest how to improve their work and say why they think this?
- Can they make a parallel circuit?

- Can they recognise that light appears to travel in straight lines?
- Can they 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?
- Can they 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?
- Can they use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them?
- Can they use a graph to answer scientific questions?
- Can they suggest how to improve their work and say why they think this?
- Can they draw conclusions from their work?
- Can they report findings from investigations through written explanations and conclusions using appropriate scientific language?

**Year 6 Greater Depth**

- Can they explain the advantages of a parallel circuit?
- Can they explain how to make changes in a circuit?
- Can they explain the impact of changes in a circuit?

- Can they explain how different colours of light can be created?
- Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton’s first reflecting telescope)
- Can they explore a range of phenomena, including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters?

Cycle 1 is indicated in in blue. Cycle 2 is indicated in pink. Objectives in black can be covered across both cycles.

Working Scientifically			
Planning	Obtaining and presenting evidence	Considering evidence and evaluating	Types of investigations
<ul style="list-style-type: none"> <li>● Can they explore different ways to test an idea, choose the best way, and give reasons?</li> <li>● Can they identify the key factors when planning a fair test?</li> <li>● Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this?</li> <li>● Can they use information to make a prediction and give reasons for it?</li> <li>● Can they use test results to make further predictions and set up further comparative tests?</li> <li>● Can they explain, in simple terms, a scientific idea and what evidence supports it?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they explain why they have chosen specific equipment? (including ICT based equipment)</li> <li>● Can they decide which units of measurement they need to use?</li> <li>● Can they make precise measurements?</li> <li>● Can they explain why a measurement needs to be repeated?</li> <li>● Can they record their measurements in different ways? (including bar charts, tables and line graphs)</li> <li>● Can they read and record measurements systematically using a range of scientific equipment with increasing accuracy and precision?</li> <li>● Can they present a report of their findings through writing, display and presentation?</li> </ul>	<ul style="list-style-type: none"> <li>● Can they find a pattern from their data and explain what it shows?</li> <li>● Can they use a graph to answer scientific questions?</li> <li>● Can they link what they have found out to other science?</li> <li>● Can they suggest how to improve their work and say why they think this?</li> <li>● Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?</li> <li>● Can they draw conclusions from their work?</li> <li>● Can they report findings from investigations through written explanations and conclusions using appropriate scientific language?</li> </ul>	<p>Children should have the opportunity to investigate through:</p> <ul style="list-style-type: none"> <li>● Recognising and controlling variables accurately and fairly, including changes over different periods of time</li> <li>● Noticing patterns, groupings and classifying</li> <li>● Carrying out comparative and fair tests</li> <li>● Finding things out using a wide range of secondary sources.</li> </ul>
Year 6 Greater Depth			
<ul style="list-style-type: none"> <li>● Can they choose the best way to answer a question and use information from different sources to plan an investigation?</li> </ul>	<p>Can they plan which equipment they will need and use it effectively? Can they explain qualitative and quantitative data?</p>	<ul style="list-style-type: none"> <li>● Can they identify scientific evidence that has been used to support or to refute ideas or arguments and link their conclusions to it?</li> <li>● Can they explain how they could improve their way of working?</li> <li>● Can they report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations?</li> </ul>	

**SCIENCE: VOCABULARY MAP**

- The vocabulary included for Reception are words that children should be exposed to. They should use some correctly in a scientific context.
- The vocabulary included from Year 1 onwards are the words that children should know and use correctly in a scientific context. They should be able to define the specialist scientific vocabulary included.
- The working scientifically vocabulary identified should be taught through the topics in each year-group during scientific enquiries.

**EYFS Vocabulary**

Animals, Changes, Describe, Different, Environment, Investigate, Observation, Plants, Seasons, Senses. Similar, Sort, Test

**Skills Based Vocabulary by Key Stage**

Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
question, change, explain, observe, record, results, identify, group, sort, predict, pattern, measure, chart, block diagram, table, tally, test, data	relevant questions, prediction, plan, observations, research, enquiry, comparative, fair, accurate, measurements, thermometer, data Logger, classify, key, diagram, graph, chart, table, conclusion, explanation, properties, evaluate, improve	variables, independent variable, dependent variable, control variable, evidence, justify, classification key, argue, causal relationship, accuracy, scatter graphs, bar graphs, line graphs, interpret, relationship, evidence

**Knowledge Based Vocabulary Year 1 – Year 6**

KEY STAGE ONE	KEY STAGE TWO
<p><b>Year 1</b></p> <ul style="list-style-type: none"> <li>• <b>Animals including humans</b> Examples of Fish, Reptiles, Mammals, Birds, Amphibians Herbivore, Omnivore, Carnivore, Sense, touch see, smell, taste, hear, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, g head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth</li> <li>• <b>Plants</b> leaf, trunk, branch, bark, root, seed, bulb, flower, petal, stem, wild, garden, deciduous, evergreen, names of trees in the local area, names of garden and wild flowering plants in the local area.</li> <li>• <b>Everyday Materials</b> object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, hard, soft, stretchy, stiff, bendy, flexible, waterproof, absorbent, rough, smooth, shiny, dull</li> <li>• <b>Seasonal Changes</b> Summer, Spring, Autumn, Winter, Day, Night,</li> </ul>	<p><b>Year 3</b></p> <ul style="list-style-type: none"> <li>• <b>Animals including humans</b> nutrients, carbohydrates, fats, proteins, vitamins, minerals, fibre, diet, skeleton, bones, joints, muscles, movement, protection, support</li> <li>• <b>Plants</b> photosynthesis, pollen, pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport.</li> <li>• <b>Rocks</b> rocks, igneous, metamorphic, sedimentary, permeable, impermeable, fossil, extinct, organic, matter, topsoil, sub soil, base rock + examples of types of rock.</li> <li>• <b>Light</b> light, light source, dark, absence of light, surface, shadow, reflect, mirror, Sun, sunlight, dangerous.</li> <li>• <b>Forces and magnets</b> force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole.</li> </ul>



Light, Dark, Season, Weather

### Year 2

- **Animals including humans** survive, need, water, air, food, diet, hygiene, exercise, healthy, unhealthy, germs, adult, offspring, reproduce, growth, baby, toddler, child, teenager, adult, old person, names of animals and their offspring.
- **Plants** light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot.
- **Living things and their habitats** Living, Dead, Habitat, survive, habitat, plant, animal, need Energy, Food chain, Predator, Prey + examples of habitats, microhabitat
- **Everyday materials and their uses** Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic

### Year 4

- **Animals including humans** digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, large intestine, rectum, anus, incisor, canine, molar, premolar, herbivore, carnivore, omnivore, producer, predator, prey
- **Living things and their habitats** vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, classification key, classify, characteristic, environment, human impact, positive, negative
- **States of Matter** matter, state, solid, liquid, gas, evaporation, condensation, temperature, thermometer, freezing, cooling, heating, melting, condensation, evaporation, precipitation
- **Sound** sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, quiet, loud, insulation
- **Electricity** electricity, electrical appliance/device, mains, plug, complete circuit, component, cell, battery, positive, negative, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol

### Year 5

- **Animals including humans** puberty, the vocabulary to describe sexual characteristics in line with the school's RSE policy
- **Living things and their habitats** - life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, cuttings
- **Materials** thermal insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting
- **Earth and Space** Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit
- **Forces** force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears

### Year 6

- **Animals including humans** heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle

- **Living things and their habitats** vertebrates, fish, amphibians, reptiles, birds, mammals, warm-blooded, cold-blooded, invertebrates, flowering, non-flowering, organism, microorganism, classification, bacteria, fungi, virus, sub-divide, classification key
- **Evolution and Inheritance** Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Variation, Inheritance, Environmental, Mutation, Competition, Survival of the Fittest
- **Light** Refraction, Reflection, Light, Spectrum, light rays
- **Electricity** series circuit, symbol, generate, cell, battery, bulb, buzzer, motor, switch, voltage, current, volume

### EXAMPLES OF DEEPER THINKING QUESTIONS

Please note that these questions are only guidance to the sort of questions that can be asked. Teachers can develop their own questions depending on how the children have grasped this topic.

In EYFS, deeper thinking is based around questioning and discussion facilitated by the observer to extend and promote a deeper level of understanding.

KEY STAGE 1	LOWER KEY STAGE 2	UPPER KEY STAGE 2
<p>What would life be like without _____ material? “Paper is suitable to make an umbrella.” Agree or disagree? (<i>insert materials/ objects as appropriate</i>).</p> <p>“When stretched, all materials stay stretched.” Agree or disagree. Explain why. If a table has been carved out of wood by a carpenter, is it natural or manmade?</p> <p>“I only eat fruit and vegetables so I must be healthy.” Agree or disagree. Explain why. What would you take to a desert island? You can only take three things. Explain why. What advice would you give to someone on how to stay healthy?</p>	<p>Why do you think fossils aren’t usually found in igneous rocks? What rock would be best to make a kitchen chopping board? Explain why.</p> <p>Are there ways where you could classify animals/plants so that they be in more than one group? Can you complete the gaps in the classification key?</p> <p>“Salt is a liquid because it takes the shape of the container.” Agree or disagree? Explain.</p> <p>What would happen in the water cycle if the temperature of the world increased? Where do puddles go?</p>	<p>Do you think that an increase in energy will always make a bulb brighter or a motor faster? Do you think that electricity has a negative impact on the world? Why?</p> <p>Evolution is the only way a species can survive. Do you agree? Water lilies have adapted to their habitat. They have large leaves. Name two ways that this can help them. What characteristics have you inherited from your parents?</p> <p>Do you agree? Observable characteristics are not the only way to scientifically group plants and animals. If you discovered a new species, how would you begin to classify it?</p>

<p>-What would happen to a polar bear if it was suddenly dropped into a desert? (<i>insert animals/habitats as appropriate</i>).</p> <p>-Show a picture of a wooden owl statue, taxidermy owl and a real owl. Which is the odd one out and why?</p> <p>Dolphins and fish both have fins, but what is different about them?</p> <p>What can a child do that a baby cannot?</p> <p>“Life cycles all end.” Agree or disagree. Explain why.</p> <p>Show a picture of a dandelion, sunflower and a daisy. Which one is the odd one out and why?</p> <p>How could trees change over the year?</p>	<p>What would happen if we didn't have a skeleton?</p> <p>What would happen if you only ate junk food for a year?</p> <p>Recommend exercises to a friend that use each main muscle in the human body.</p> <p>How would a growth in sparrowhawks affect the food chain?</p> <p>Design a seed to disperse in the desert. Explain your reasoning.</p> <p>What would happen in a world without bees?</p> <p>Which part of a plant do you think is the most important? Explain why.</p>	<p>How would the world be different if there was no natural light?</p> <p>Show a picture of a straw in a glass of water. Jim says, 'I think the straw is broken'. Joe says, 'Light can't travel through water, so it has bent the straw.' Do you agree or disagree. Explain. True or false. Light is invisible. Explain why.</p> <p>What do you think is the worst healthy villain? Smoking, drinking alcohol or being overweight. Justify your response.</p> <p>Relate the transportation of water in humans and animals to your knowledge of plants.</p> <p>“All drugs are bad for you”. Agree or disagree? Explain why.</p> <p>The heart is a muscle that needs to be exercised regularly. Describe three ways in which we can exercise our heart.</p>
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**Science Long Term Plan:  
Key Stage One**

	<b>Cycle 1</b>	<b>Cycle 2</b>
<b>Autumn 1</b>	<p style="text-align: center;"><b><u>Materials</u></b></p> <p>Identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock.</p> <p>Distinguish between an object and the material from which it is made.</p> <p>Identify and compare the suitability of a variety of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses.</p> <p><b>SEASONAL CHANGE (Autumn)</b></p>	<p style="text-align: center;"><b><u>Animals including humans</u></b></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><b>SEASONAL CHANGE (Autumn)</b></p>
<b>Autumn 2</b>	<p style="text-align: center;"><b><u>Materials</u></b></p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p style="text-align: center;"><b><u>Materials</u></b></p> <p>Describe some 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>
<b>Spring 1</b>	<p style="text-align: center;"><b><u>Animals including humans</u></b></p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p><b>SEASONAL CHANGE (Winter)</b></p>	<p style="text-align: center;"><b><u>Animals including humans</u></b></p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</p> <p><b>SEASONAL CHANGE (Winter)</b></p>
<b>Spring 2</b>	<p style="text-align: center;"><b><u>Living things and their habitats</u></b></p> <p>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.</p> <p>Explore and compare the differences between things that are living, dead, and things that have never been alive.</p>	<p style="text-align: center;"><b><u>Living thing and their habitats</u></b></p> <p>Identify and name a variety of plants and animals in their habitats, including microhabitats.</p>

<b>Summer 1</b>	<b><u>Animals including humans</u></b>	<b><u>Plants</u></b>
	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Notice that animals, including humans, have offspring which grow into adults.</p> <p><b>SEASONAL CHANGE (Spring)</b></p>	<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>
<b>Summer 2</b>	<b><u>Plants</u></b>	<b><u>Living things and their habitats</u></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><b>SEASONAL CHANGE (Summer)</b></p>	<p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>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.</p> <p><b>SEASONAL CHANGE (Summer)</b></p>
<p><b>← Seasonal changes →</b></p> <p><b>Y1:</b> observe changes across the 4 seasons</p> <p><b>Y2:</b> observe and describe weather associated with the seasons and how day length varies</p>		

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

Sc1/1.1 asking simple questions and recognising that they can be answered in different ways

Sc1/1.2 observing closely, using simple equipment

Sc1/1.3 performing simple tests

Sc1/1.4 identifying and classifying

Sc1/1.5 using their observations and ideas to suggest answers to questions

Sc1/1.6 gathering and recording data to help in answering questions

**Science Long Term Plan:  
Lower Key Stage 2**

	<b>Cycle 1</b>	<b>Cycle 2</b>
<b>Autumn 1</b>	<p style="text-align: center;"><b><u>Rocks</u></b></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 style="text-align: center;"><b><u>Light</u></b></p> <p>Recognise that we need light in order to see things and that dark is the absence of light. 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 shadow changes.</p>
<b>Autumn 2</b>	<p style="text-align: center;"><b><u>Living Things and their Habitats</u></b></p> <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 style="text-align: center;"><b><u>Sound</u></b></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>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>
<b>Spring 1</b>	<p style="text-align: center;"><b><u>States Of Matter</u></b></p> <p>Compare and group solids, liquids or gasses.</p> <p>Observe that some materials change state when heated or cooled and measure or research the temperature at which this happens in °c.</p>	<p style="text-align: center;"><b><u>Animals including Humans</u></b></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>

<b>Spring 2</b>	<b><u>States Of Matter</u></b>	<b><u>Living Things and their Habitats</u></b>
	Identify evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Recognise that environments can change and that this can sometimes pose dangers to living things.
<b>Summer 1</b>	<b><u>Animals including Humans</u></b>	<b><u>Electricity</u></b>
	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.  Construct and interpret a variety of food chains, identifying producers, predators and prey.	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 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>Summer 2</b>	<b><u>Plants</u></b>	<b><u>Forces and magnets</u></b>
	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 formation and seed dispersal	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.

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

Sc4/1.1 asking relevant questions and using different types of scientific enquiries to answer them

Sc4/1.2 setting up simple practical enquiries, comparative and fair tests

Sc4/1.3 making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

Sc4/1.4 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

Sc4/1.5 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

Sc4/1.6 reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

Sc4/1.7 using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

Sc4/1.8 identifying differences, similarities or changes related to simple scientific ideas and processes

Sc4/1.9 using straightforward scientific evidence to answer questions or to support their findings



**Science Long Term Plan:**

**Upper Key Stage Two**

	<b>Cycle 1</b>	<b>Cycle 2</b>
<b>Autumn 1</b>	<p align="center"><b><u>Electricity</u></b></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 and the on/off position of switches.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<p align="center"><b><u>Living Things and their habitats</u></b></p> <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>
<b>Autumn 2</b>	<p align="center"><b><u>Evolution and Inheritance</u></b></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 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 align="center"><b><u>Forces</u></b></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>
<b>Spring 1</b>	<p align="center"><b><u>Living Things and their Habitats</u></b></p> <p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p>	<p align="center"><b><u>Earth and Space</u></b></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>

Spring 2	<p style="text-align: center;"><b><u>Light</u></b></p> <p>Recognise that light appears to travel in straight lines.</p> <p>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 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 style="text-align: center;"><b><u>Properties and Changes of Materials- continued to Summer 1</u></b></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>
Summer 1	<p style="text-align: center;"><b><u>Animals Including Humans</u></b></p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>	<p style="text-align: center;"><b><u>Animals including Humans</u></b></p> <p>Describe the changes as humans develop to old age.</p>
Summer 2	<p style="text-align: center;"><b><u>Animals Including Humans</u></b></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 style="text-align: center;"><b><u>Animals including Humans</u></b></p> <p>Describe the changes as humans develop to old age.</p>

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

Sc6/1.1 planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

Sc6/1.2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision

Sc6/1.3 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs

Sc6/1.4 using test results to make predictions to set up further comparative and fair tests

Sc6/1.5 using simple models to describe scientific ideas

Sc6/1.6 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations