

# Ridgeway Primary School Curriculum



Science

Team Ridgeway's Vision:

**Igniting curiosity**



**Nurturing growth**

**Ambitious** **Respectful** **Celebrating difference**



Team Ridgeway's Culture:



**Values:**

Our values for the whole school community are...

- **Ambitious** (being our brilliant best)
- **Respectful** (of ourselves, other people and our environment)
- **Celebrating difference** (promoting tolerance in ourselves & others)

We work towards these values using them as our Curriculum Drivers and using our LEARNERS Code.



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# Science - Triple i

## Intent:

The intent of our Science Curriculum is to cultivate scientific thinkers by...

- Developing scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Developing understanding of the nature process and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- Equipping pupils with the scientific knowledge required to understanding the uses and implications of science today and for the future.
- Providing an interesting and varied curriculum that interests and intrigues our children while meeting the needs of all backgrounds, cultures and abilities.
- Enabling teachers to deliver fun, interesting and challenging lessons that use age appropriate scientific vocabulary relating to their topic.
- Promoting scientific intrigue for all pupils and support them to develop a passion for scientific enquiry.



## Implementation:

Our science curriculum is implemented through a variety of interactive and engaging activities. The Science overview ensures each year group covers a range of topics in line with the National Curriculum for their year group. Our progression of knowledge and vocabulary document gives a clear overview for teachers to follow to ensure all relevant scientific knowledge and vocabulary is taught in each topic for every year group, and so teachers can plan appropriate lessons and resources that will meet the needs of all pupils (including SEND pupils).

We teach working scientifically skills in each year group to ensure pupils are practising and developing these skills. All pupils are taught what Scientists do, and teachers will explain which Scientists skills they are using in each lesson, so pupils have a clear understanding of both the knowledge and skills they are learning in each lesson.

Wherever possible, our Science curriculum is enhanced by cross-curricular learning by linking Science with other STEAM subjects to allow pupils to become critical and creative thinkers – key skills they need to thrive in future society

Learning from previous years is revisited through the school retrieval strategy which enables teachers to access pupils current understanding and retention of previous concepts taught and ensure any misconceptions and gaps in knowledge are addressed before extending their knowledge in line with their current year group progression.



## Impact:

The impact of our science curriculum is multifaceted. Children at Ridgeway develop a strong foundation in science.

Children will achieve age related expectations in science at the end of their academic year and use relevant and age-appropriate vocabulary to discuss what they have learnt. Children will understand what Scientists skills are and will be able to talk about the skills they use in each lesson. They will develop their scientific inquiry skills and demonstrate that they can conduct age-appropriate scientific inquiries using skills they have been specifically taught in that year group.

Children will be engaged and enthusiastic in their science lessons to learn new concepts and knowledge. They will retain key knowledge, skills and vocabulary from previous year groups via the use of regular retrieval practice.





# Science Block 1: Term 2



# Block 1: National Curriculum Coverage

	Block	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Block 1: Term 2	wk1	Animals including humans	Living Things & Habitats	Rocks	Electricity	Forces	Living Things & Habitats
	wk2	Animals including humans	Living Things & Habitats	Rocks / Light	Electricity	Forces	Living Things & Habitats
	wk3	Animals including humans & 1 lesson season	Living Things & Habitats	Light	Sound	Space	Living Things & Habitats
	wk4	Plants	Animals inc humans	Forces & Magnets	Animals inc humans	Space/ Living things	Evolution Inheritance
	wk5	Plants & 1 lesson season	Animals inc humans	Forces & Magnets	Animals inc humans	Living things	Evolution Inheritance

## Year 1: Animals, including humans (14 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. Identify and name common animals</li><li>2. Identify and name common animals that are herbivore, carnivore and omnivore</li><li>3. Describe and compare the structure of animals</li><li>4. Identify, draw, name and label the human body</li><li>5. Which part of the body is associated with each sense.</li></ol>	<ul style="list-style-type: none"><li>▪ identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li><li>▪ identify and name a variety of common animals that are carnivores, herbivores and omnivores <b>D3</b></li><li>▪ describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</li><li>▪ identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. <b>D2</b></li></ul>

## Year 1: Plants (9 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. Identify and name a variety of common wild and garden plants</li><li>2. identify and name a variety of deciduous and evergreen trees</li><li>3. identify and describe the basic structure of a variety of common flowering plants</li><li>4. identify and describe the basic structure of a variety of trees</li></ol>	<ul style="list-style-type: none"><li>▪ identify and name a variety of common wild and garden plants, including deciduous and evergreen trees <b>P1, R2, D1</b></li><li>▪ identify and describe the basic structure of a variety of common flowering plants, including trees. <b>R1</b></li></ul>

## Year 1: Seasonal changes (1 hour at the end of each unit)

### Objectives

- identify and name a variety of common wild and garden plants, including deciduous and evergreen trees **P1, R2, D1**
- identify and describe the basic structure of a variety of common flowering plants, including trees. **R1**

## Year 1: Working Scientifically

Plan	P1. Asking simple questions and recognising that they can be answered in different ways
Do	D1. Observing closely, using simple equipment D2. Performing simple tests D3. Identifying and classifying
Review	R1. Using their observations and ideas to suggest answers to questions R2. Gathering and recording data to help in answering questions.

## Year 2: Animals, including humans (10 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. To know the 7 life processes - movement, respiration, sensitivity, growth, reproduction, excretion, nutrition</li><li>2. To stay alive all animals, have 3 basic needs - air, water and food. Animals have their basic needs provided for by their habitat and have adapted to the habitat they live in</li><li>3. To stay healthy humans need food and water, sleep, air, exercise, good hygiene and a balanced diet</li></ol>	<ul style="list-style-type: none"><li>▪ notice that animals, including humans, have offspring which grow into adults <b>R1 D3</b></li><li>▪ find out about and describe the basic needs of animals, including humans, for survival (water, food and air) <b>P1 D3</b></li><li>▪ describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. <b>R1 P1 D1</b></li></ul>

## Year 2: Living things and their habitats (15 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. A habitat is the natural place something lives. A habitat provides a living thing with everything it needs to survive. Identify the main habitats and animals that live in them</li><li>2. A food chain shows how each animal gets its food. Food chains start with a producer which is eaten by a consumer which is eaten by a bigger consumer. It shows how living things depend on each other to survive.</li><li>3. Life cycles - some animals give birth to live young and some lay eggs from which the young hatch. Some animals have young that look like them, other animals go through metamorphosis. All young animals change as they go through the different stages of their life cycle to grow into adults.</li></ol>	<ul style="list-style-type: none"><li>▪ explore and compare the differences between things that are living, dead, and things that have never been alive <b>D3 R1</b></li><li>▪ 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 <b>P1 D3</b></li><li>▪ identify and name a variety of plants and animals in their habitats, including microhabitats <b>P1 D1</b></li><li>▪ 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 <b>P1 D3 R1</b></li></ul>

## Year 2: Working Scientifically

Plan	P1. asking simple questions and recognising that they can be answered in different ways
Do	D1. observing closely, using simple equipment D2. performing simple tests D3. identifying and classifying
Review	R1. using their observations and ideas to suggest answers to questions R2. gathering and recording data to help in answering questions.

## Year 3: Rocks (5 hours)

Core Learning	Objectives
<p>1. There are three types of rock:</p> <ul style="list-style-type: none"><li>▪ Sedimentary: Formed from particles of sand, shells, pebbles, and other fragments of material. Examples include sandstone and limestone.</li><li>▪ Metamorphic: Formed under the surface of the earth from the change that occurs due to intense heat and pressure. Examples include marble and slate.</li><li>▪ Igneous: Formed when magma (molten rock deep within the Earth) cools and hardens.</li></ul> <p>2. Properties of Rocks: Rocks can be grouped based on their appearance and simple physical properties such as hardness, colour and permeability.</p> <p>3. Formation of Fossils: Fossils are formed when living things are trapped within rock.</p> <p>4. Soils: Soils are made from rocks and organic matter.</p> <p>5. Practical Investigations:</p> <ul style="list-style-type: none"><li>▪ Rocks can be observed and described using hand lenses or microscopes.</li><li>▪ Rocks can be tested for properties like hardness and porosity.</li><li>▪ Investigations can be done with rocks to see how they change over time and how they interact with water.</li></ul>	<ul style="list-style-type: none"><li>▪ compare and group together different kinds of rocks on the basis of their appearance and simple physical properties <b>(D2, R1)</b></li><li>▪ describe in simple terms how fossils are formed when things that have lived are trapped within rock <b>(R3)</b></li><li>▪ recognise that soils are made from rocks and organic matter. <b>(R4)</b></li></ul>

## Year 3: Light (10 hours)

Core Learning	Objectives
<p>1. Light and Seeing:</p> <ul style="list-style-type: none"><li>▪ Light is necessary to see things and darkness is the absence of light.</li><li>▪ Light travels from a source and enters our eyes, allowing us to see.</li></ul> <p>2. Reflection:</p> <ul style="list-style-type: none"><li>▪ Light is reflected from surfaces, which helps us see objects that do not produce their own light.</li></ul> <p>3. Sun Safety:</p> <ul style="list-style-type: none"><li>▪ Light from the sun can be dangerous and we need to protect our eyes and skin from it.</li></ul> <p>4. Shadows:</p> <ul style="list-style-type: none"><li>▪ Shadows are formed when light from a light source is blocked by a solid object.</li><li>▪ The size and shape of shadows change depending on the position of the light source.</li></ul> <p>5. Practical Investigations:</p> <ul style="list-style-type: none"><li>▪ Light can be observed by using mirrors to reflect light or creating shadows with different objects.</li><li>▪ The size of shadows can be measured and recorded.</li></ul>	<ul style="list-style-type: none"><li>▪ recognise that they need light in order to see things and that dark is the absence of light <b>(D1)</b></li><li>▪ notice that light is reflected from surfaces</li><li>▪ recognise that light from the sun can be dangerous and that there are ways to protect their eyes <b>(R4)</b></li><li>▪ recognise that shadows are formed when the light from a light source is blocked by an opaque object <b>(P2, R2)</b></li><li>▪ find patterns in the way that the size of shadows change.</li></ul>

## Year 3: Forces and magnets (10 hours)

Core Learning	Objectives
<p>1. <b>Understanding Forces:</b></p> <ul style="list-style-type: none"><li>▪ <b>Pushes and Pulls:</b> Forces are pushes and pulls that can make objects move, stop, or change shape.</li><li>▪ <b>Contact and Non-Contact Forces:</b> Some forces need contact between two objects (e.g. pushing a door), while magnetic forces can act at a distance.</li></ul> <p>2. <b>Magnets and Magnetic Forces:</b> Magnets attract or repel each other and will attract some materials but not others.</p> <p>3. <b>Magnetic Materials:</b> Everyday materials can be compared and grouped based on whether they are attracted to a magnet.</p> <p>4. <b>Magnet Poles:</b> Magnets have two poles (north and south).</p> <p>5. <b>Practical Investigations:</b></p> <ul style="list-style-type: none"><li>▪ <b>Movement on Different Surfaces:</b> Friction is the force that causes different objects to slow down or stop moving on various surfaces.</li><li>▪ <b>Strength of Magnets:</b> Magnets have different strengths, and we can compare these by conducting a fair test.</li><li>▪ <b>Magnetic Fields:</b> Magnetic forces can be investigated by how they act through different materials and at a distance.</li></ul>	<ul style="list-style-type: none"><li>▪ compare how things move on different surfaces <b>(D1)</b></li><li>▪ notice that some forces need contact between two objects, but magnetic forces can act at a distance <b>(P1)</b></li><li>▪ observe how magnets attract or repel each other and attract some materials and not others <b>(D1)</b></li><li>▪ compare and group together a variety of everyday materials based on whether they are attracted to a magnet, and identify some magnetic materials <b>(D2)</b></li><li>▪ describe magnets as having two poles <b>(R4)</b></li><li>▪ predict whether two magnets will attract or repel each other, depending on which poles are facing. <b>(P1)</b></li></ul>

## Year 3: Working Scientifically

Plan	<p>P1. asking relevant questions and using different types of scientific enquiries to answer them</p> <p>P2. setting up simple practical enquiries, comparative and fair tests</p>
Do	<p>D1. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <p>D2. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>D3. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p>
Review	<p>R1. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>R2. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>R3. identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>R4. using straightforward scientific evidence to answer questions or to support their findings.</p>

## Year 4: Electricity (10 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. identify electrical appliances and the types of electricity they use.</li><li>2. identify complete and incomplete circuits.</li><li>3. identify and sort materials into electrical conductors or insulators.</li><li>4. explain how a switch works and why they are Needed.</li><li>5. record and report on an investigate different switches and their uses.</li></ol>	<ul style="list-style-type: none"><li>▪ identify common appliances that run on electricity <b>(P1)</b></li><li>▪ construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers <b>(P2)</b></li><li>▪ 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 <b>(R2)</b></li><li>▪ recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit <b>(R2)</b></li><li>▪ recognise some common conductors and insulators, and associate metals with being good conductors. <b>(D1)</b></li></ul>

## Year 4: Sound (5 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. I can describe and explain sound sources</li><li>2. I can explain how different sounds travel.</li><li>3. I can explore ways to change the pitch of a sound.</li><li>4. I can investigate ways to absorb sound.</li><li>5. I can make a musical instrument to play different sounds.</li></ol>	<ul style="list-style-type: none"><li>▪ identify how sounds are made, associating some of them with something vibrating <b>(P1)</b></li><li>▪ recognise that vibrations from sounds travel through a medium to the ear <b>(R4)</b></li><li>▪ find patterns between the pitch of a sound and features of the object that produced it <b>(D2) (R1)</b></li><li>▪ find patterns between the volume of a sound and the strength of the vibrations that produced it <b>(R3)</b></li><li>▪ recognise that sounds get fainter as the distance from the sound source increases. <b>(R3)</b></li></ul>

## Year 4: Animals, including humans (10 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. Plan an investigation into tooth decay and draw conclusions.</li><li>2. Identify and examine different types of human &amp; animal's teeth.</li><li>3. Identify the parts of the digestive system and their function.</li><li>4. Demonstrate and explain the process of digestion.</li><li>5. Construct &amp; Interpret food chains, identifying producers, predators and prey.</li></ol>	<ul style="list-style-type: none"><li>▪ describe the simple functions of the basic parts of the digestive system in humans <b>(D3)</b></li><li>▪ identify the different types of teeth in humans and their simple functions <b>(R3)</b></li><li>▪ construct and interpret a variety of food chains, identifying producers, predators and prey. <b>(D3)</b></li></ul>

## Year 4: Working Scientifically

### Plan

- P1. asking relevant questions and using different types of scientific enquiries to answer them
- P2. setting up simple practical enquiries, comparative and fair tests

### Do

- D1. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- D2. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- D3. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

### Review

- R1. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- R2. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- R3. identifying differences, similarities or changes related to simple scientific ideas and processes
- R4. using straightforward scientific evidence to answer questions or to support their findings.

## Year 5: Forces (10 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. Objects fall towards the Earth because of the force of gravity</li><li>2. Friction, air and water resistance are all forces that act upon all moving surfaces.</li><li>3. Gears levers and pulleys are used to allow a smaller force to have a greater effect.</li><li>4. Isaac Newton discovered gravity.</li><li>5. A force is a push or pull.</li></ol>	<ul style="list-style-type: none"><li>▪ explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object <b>D2</b></li><li>▪ identify the effects of air resistance, water resistance and friction, that act between moving surfaces <b>D1</b></li><li>▪ recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li></ul>

## Year 5: Earth and space (7.5 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. The planets in the solar system move around the sun.</li><li>2. The moon moves around the earth and affects the earths tides.</li><li>3. Who/how the earth was proven to be round.</li><li>4. There are nearly 365 days in a full rotation around the sun.</li><li>5. The earth spins on its axis.</li></ol>	<ul style="list-style-type: none"><li>▪ describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li><li>▪ describe the movement of the Moon relative to the Earth</li><li>▪ describe the Sun, Earth and Moon as approximately spherical bodies <b>R3</b></li><li>▪ use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li></ul>

## Year 5: Living things and their habitats (7.5 hours)

Core Learning	Objectives
<ol style="list-style-type: none"> <li>1. Animals can be broken into groups: e.g Mammal, Amphibians, insects and birds.</li> <li>2. Different animal groups have different life cycles.</li> <li>3. Mammals use sexual reproduction to have offspring.</li> <li>4. Some plants use asexual reproduction to have offspring.</li> <li>5. Some animals go through metamorphosis.</li> </ol>	<ul style="list-style-type: none"> <li>▪ describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird <b>R2</b></li> <li>▪ describe the life process of reproduction in some plants and animals.</li> </ul>

## Year 5: Working Scientifically

Plan	P1. planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	D1. taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate D2. recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Review	R1. using test results to make predictions to set up further comparative and fair tests R2. reporting and presenting 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 R3. identifying scientific evidence that has been used to support or refute ideas or arguments.

## Year 6: Living things and their habitats (15 hours) & Evolution and inheritance (10 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. The four main groups of living things are plants, animals, fungi and micro-organisms.</li><li>2. I know that some animals are vertebrates (have a skeleton) and some animals do not (invertebrates)</li><li>3. I know there are 5 main types of animal kingdoms: reptiles, amphibians, mammals, fish (x3), birds.</li><li>4. I can use a 'tree diagram' to ask questions which show how animals have evolved over time.</li><li>5. I know that species evolve due to changing climate, food options, predators or prey: and this is evidenced with fossil finds.</li></ol>	<ul style="list-style-type: none"><li>▪ 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 <b>(P1) (D2)</b></li><li>▪ give reasons for classifying plants and animals based on specific characteristics. <b>(D2)</b></li><li>▪ recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago <b>(R2) (R3)</b></li><li>▪ recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents <b>(R2) (R3)</b></li><li>▪ identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. <b>(D2) (R3)</b></li></ul>

# Year 6: Working Scientifically

Plan	P1. planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	D1. taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate D2. recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Review	R1. using test results to make predictions to set up further comparative and fair tests R2. reporting and presenting 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 R3. identifying scientific evidence that has been used to support or refute ideas or arguments.

## Coverage of the areas of Science



# Science Block 2: Term 5



## Block 2: National Curriculum Coverage

	Block	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Block 2: Term 5	wk1	Everyday materials	Plants	Plants	Living things & habitats	Properties and changes	Light
	wk2	Everyday materials	Plants	Plants	Living things & habitats	Properties and changes	Electricity
	wk3	Everyday materials	Materials	Animals inc humans	States of Matter	Properties and changes	Animals, incl Humans
	wk4	Everyday materials & 1 lesson season	Materials	Animals inc humans	States of Matter	Animals inc humans	Animals incl. Humans

## Year 1: Everyday materials (14 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. Identify and name common animals</li><li>2. Identify and name common animals that are herbivore, carnivore and omnivore</li><li>3. Describe and compare the structure of animals</li><li>4. Identify, draw, name and label the human body</li><li>5. Which part of the body is associated with each sense.</li></ol>	<ul style="list-style-type: none"><li>▪ distinguish between an object and the material from which it is made</li><li>▪ identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li><li>▪ describe the simple physical properties of a variety of everyday materials <b>D2</b></li><li>▪ compare and group together a variety of everyday materials on the basis of their simple physical properties. <b>R2</b></li></ul>

## Year 1: Seasonal changes (1 hour at the end of each unit)

### Objectives

- identify and name a variety of common wild and garden plants, including deciduous and evergreen trees **P1, R2, D1**
- identify and describe the basic structure of a variety of common flowering plants, including trees. **R1**

# Year 1: Working Scientifically

Plan

P1. Asking simple questions and recognising that they can be answered in different ways

Do

D1. Observing closely, using simple equipment  
D2. Performing simple tests  
D3. Identifying and classifying

Review

R1. Using their observations and ideas to suggest answers to questions  
R2. Gathering and recording data to help in answering questions.

## Year 2: Plants (10 hours)

### Core Learning

1. Germination – when the conditions are right the seed soaks up water and swells. The tiny new plant bursts out of its shell.
2. The life cycle of a flowering plant
3. Plants need certain conditions for growth – sunlight, warmth and water.
4. Seed dispersal is when the seeds move away from the parent plant. There are different types of seed dispersal.

### Objectives

- observe and describe how seeds and bulbs grow into mature plants  
P1 D1 D2
- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. P1 D1 D2 R1 R2

## Year 2: Uses of everyday materials (10 hours)

Core Learning	Objectives
<ol style="list-style-type: none"> <li>1. Materials are what objects are made from eg wood, glass, plastic, metal, paper, cardboard, fabric, rubber.</li> <li>2. Suitability means having the properties which are right for a specific purpose.</li> <li>3. Materials have different properties. This is what a material is like or how it behaves eg waterproof, transparent, flexible, strong, stiff, hard wearing etc</li> <li>4. Facts about an inventor of a new material eg John Macadam or Charles Macintosh</li> </ol>	<ul style="list-style-type: none"> <li>▪ identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses <b>D1 P1 D2 R1 R2</b></li> <li>▪ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. <b>D1 P1 D2 R1 R2</b></li> </ul>

## Year 2: Working Scientifically

Plan	P1. asking simple questions and recognising that they can be answered in different ways
Do	<ol style="list-style-type: none"> <li>D1. observing closely, using simple equipment</li> <li>D2. performing simple tests</li> <li>D3. identifying and classifying</li> </ol>
Review	<ol style="list-style-type: none"> <li>R1. using their observations and ideas to suggest answers to questions</li> <li>R2. gathering and recording data to help in answering questions.</li> </ol>

## Year 3: Plants (10 hours)

Core Learning	Objectives
Details coming soon	<ul style="list-style-type: none"><li>▪ identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers <b>(R3)</b></li><li>▪ 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 <b>(R4)</b></li><li>▪ investigate the way in which water is transported within plants <b>(P2, D3)</b></li><li>▪ explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <b>(R1)</b></li></ul>

## Year 3: Animals, including humans (10 hours)

Core Learning	Objectives
Details coming soon	<ul style="list-style-type: none"><li>▪ identify that animal, 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 <b>(R4)</b></li><li>▪ identify that humans and some other animals have skeletons and muscles for support, protection and movement. <b>(P1)</b></li></ul>

## Year 3: Working Scientifically

Plan	<p>P1. asking relevant questions and using different types of scientific enquiries to answer them</p> <p>P2. setting up simple practical enquiries, comparative and fair tests</p>
Do	<p>D1. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <p>D2. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>D3. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p>
Review	<p>R1. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>R2. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>R3. identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>R4. using straightforward scientific evidence to answer questions or to support their findings.</p>

## Year 4: Living things and their habitats (10 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. Plan an investigation into tooth decay and draw conclusions.</li><li>2. Identify and examine different types of human &amp; animal's teeth.</li><li>3. Identify the parts of the digestive system and their function.</li><li>4. Demonstrate and explain the process of digestion.</li><li>5. Construct &amp; Interpret food chains, identifying producers, predators and prey.</li></ol>	<ul style="list-style-type: none"><li>▪ recognise that living things can be grouped in a variety of ways <b>(P1)</b></li><li>▪ explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment <b>(P1)</b></li><li>▪ recognise that environments can change and that this can sometimes pose dangers to living things. <b>(R4)</b></li></ul>

## Year 4: States of matter (10 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. Sort and describe materials into solids, liquids and gases.</li><li>2. Investigate how heating and cooling can change a material's state.</li><li>3. I can explore how water can change its state to a solid, liquid or a gas.</li><li>4. I can investigate how water evaporates.</li><li>5. Identify and describe the different stages of the water cycle.</li></ol>	<ul style="list-style-type: none"><li>▪ compare and group materials together, according to whether they are solids, liquids or gases <b>(D2)</b></li><li>▪ observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (<math>^{\circ}\text{C}</math>) <b>(D1)</b></li><li>▪ identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <b>(D1) (R1)</b></li></ul>

## Year 4: Working Scientifically

### Plan

- P1. asking relevant questions and using different types of scientific enquiries to answer them
- P2. setting up simple practical enquiries, comparative and fair tests

### Do

- D1. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- D2. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- D3. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

### Review

- R1. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- R2. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- R3. identifying differences, similarities or changes related to simple scientific ideas and processes
- R4. using straightforward scientific evidence to answer questions or to support their findings.

## Year 5: Properties and changes of materials (15 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. The 3 states of matter are: Solid, Liquid and Gas.</li><li>2. Some materials will dissolve in a liquid to produce a solution.</li><li>3. Different materials are used for their different properties: hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets)</li><li>4. Some changes can be reversible.</li><li>5. When new materials are formed, this change is not usually reversible.</li></ol>	<ul style="list-style-type: none"><li>▪ 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 <b>P1</b></li><li>▪ know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution <b>R1</b></li><li>▪ use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li><li>▪ give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li><li>▪ demonstrate that dissolving, mixing and changes of state are reversible changes</li><li>▪ 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></ul>

## Year 5: Animals, including humans (5 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. The human body undergoes changes throughout life.</li><li>2. During pregnancy cells fuse together to become a foetus.</li><li>3. Puberty occurs during adolescence.</li></ol>	<ul style="list-style-type: none"><li>▪ describe the changes as humans develop to old age.</li></ul>

## Year 5: Working Scientifically

Plan	P1. planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	D1. taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate D2. recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Review	R1. using test results to make predictions to set up further comparative and fair tests R2. reporting and presenting 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 R3. identifying scientific evidence that has been used to support or refute ideas or arguments.

## Year 6: Light (5 hours) & Electricity (5 hours)

Core Learning	Objectives
<ol style="list-style-type: none"><li>1. Light travels in straight lines and therefore objects are seen because the light reflects to our eyes.</li><li>2. Light travels in straight lines which explains why shadows have the same shape as the object.</li><li>3. The higher the voltage of the batteries, the brighter the bulb; the louder the buzzer.</li><li>4. Circuits can be controlled by various components, especially switches.</li><li>5. Electricity is very dangerous.</li></ol>	<ul style="list-style-type: none"><li>▪ recognise that light appears to travel in straight lines <b>(P1) (R2)</b></li><li>▪ 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 <b>(P1) (D2) (R2)</b></li><li>▪ 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 <b>(D2) (R2)</b></li><li>▪ use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. <b>(P1) (D1) (D2) (R1) (R2)</b></li><li>▪ associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit <b>(P1) (D2) (R2)</b></li><li>▪ 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 <b>(P1) (D2) (R1) (R2)</b></li><li>▪ use recognised symbols when representing a simple circuit in a diagram. <b>(D2)</b></li></ul>

## Year 6: Animals including humans (10 hours)

Core Learning	Objectives
<ol style="list-style-type: none"> <li>1. The main organs of the circulatory (raspatory) system are the heart and lungs</li> <li>2. Air (oxygen) is drawn into our bodies and dirty air (carbon dioxide) is expelled.</li> <li>3. Our bodies function better when we have good exercise, diet and lifestyle.</li> <li>4. Vital nutrients and minerals are transported round our bodies via our blood and blood vessels.</li> </ol>	<ul style="list-style-type: none"> <li>▪ identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood <b>(D1) (D2) (R3)</b></li> <li>▪ recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function <b>(R3)</b></li> <li>▪ describe the ways in which nutrients and water are transported within animals, including humans. <b>(R3)</b></li> </ul>

## Year 6: Working Scientifically

Plan	P1. planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Do	D1. taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate D2. recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Review	R1. using test results to make predictions to set up further comparative and fair tests R2. reporting and presenting 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 R3. identifying scientific evidence that has been used to support or refute ideas or arguments.

# Progression of Scientific Enquiry Skills & Vocabulary

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Vocabulary</b> (new vocab for each year group in red)	Question, answers, scientist, observe, experiment, equipment, beaker, pipette.	Questions, answers, equipment, gather, measure, record, results, sort, group, test, explore, observe, compare, describe, similar/ities, beaker, pipette, syringe	Previous vocab plus observe changes over time, notice patterns, secondary sources, hand lenses, egg timers, identify, classify, data,	Previous vocab plus scientific enquiry changes over time, notice patterns, secondary sources, comparative tests, fair tests, careful, accurate, observations, equipment, gather, measure, record, data, evidence, results, keys, bar charts, table, results, conclusions, predictions, support, thermometers	Previous vocab plus enquiry types increase, decrease, identify, classify, order, notice patterns, relationships, appearance, present results, data loggers	Previous vocab plus, notice patterns, relationships, independent variable, dependent variable, controlled variable, accuracy, precision, degree of trust, classification keys, scatter graphs, line graphs, causal relationships, support/refute, data loggers	Previous vocab plus opinion/fact, confidently name scientific enquiry types.
<b>Plan</b>	Begin to understand that science experiments often begin with a question that needs answering.  Begin to ask science-based questions with modelled sentence stems – how/what/why/when	Ask simple questions when prompted.  Suggest ways of answering a question.	Ask simple questions.  Recognise that questions can be answered in different ways.	Ask relevant questions when prompted.  Use different types of scientific enquiry to answer them.  Set up simple and practical enquiries, comparative and fair tests with some support.	Ask relevant questions.  Use different types of scientific enquiries to answer their questions.  Set up simple and practical enquiries, comparative and fair tests.	Plan different types of scientific enquiries to answer questions.  With prompting, recognise and control variables where necessary.	Plan different types of scientific enquiries to answer questions.  Recognise and control variables where necessary.

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Do</b>	<p>Begin to understand the meaning of an experiment.</p> <p>Begin to understand what a scientist 'does.'</p> <p>Begin to understand that an experiment requires equipment.</p> <p>Make observations with support and prompts (link to above question stems).</p>	<p>Make relevant observations using simple equipment.</p> <p>Conduct simple tests, with support.</p> <p>Identify and classify with guidance.</p>	<p>Observe closely, using simple equipment.</p> <p>Perform simple tests.</p> <p>Identify and classify.</p>	<p>Make systematic and careful observations, using simple equipment.</p> <p>Use standard units when taking measurements.</p>	<p>Make systematic and careful observations using a range of equipment, including thermometers and data loggers.</p> <p>Take accurate measurements using standard units, where appropriate.</p>	<p>Select, with prompting, and use appropriate equipment to take readings.</p> <p>Take precise measurements using standard units.</p> <p>Begin to understand the need for repeat reading.</p>	<p>Use a range of scientific equipment to take measurements.</p> <p>Take measurements with increasing accuracy and precision.</p> <p>Take repeat readings when appropriate.</p>
<b>Record</b>	<p>Begin to understand the need to record results after an experiment.</p> <p>Make verbal observations of what they see.</p> <p>Discuss what they see with their peers.</p> <p>Begin to record findings initially with drawings, moving to written drawings with simple sentences (end of year).</p>	<p>Gather and record data.</p>	<p>Record and communicate their findings in a range of ways and begin to use simple scientific language.</p> <p>Gather and record data to help answer questions.</p>	<p>With modelling and guidance, gather, record, classify and present data in a variety of ways to help to answer questions.</p> <p>With prompting, use various ways of recording, grouping and displaying evidence and suggest how findings may be tabulated.</p>	<p>Gather, record, classify and present data in a variety of ways to help to answer questions.</p> <p>Record findings using simple scientific language, drawings and labelled diagrams.</p> <p>Record findings using keys, bar charts, and tables.</p>	<p>Take and process repeat readings.</p> <p>Record data and results.</p> <p>Record data using labelled diagrams, keys, tables and charts.</p> <p>Use line graphs to record data.</p>	<p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar charts and line graphs.</p>

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Review	<p>With support, begin to understand how an experiment can answer a question.</p> <p>Verbally make a link between a scientific question (experiment) and their findings.</p>	<p>Recognise findings.</p> <p>Use their observations and ideas to suggest answers to simple questions.</p>	<p>Use their observations and ideas to suggest answers to simple questions.</p>	<p>With prompting, suggest conclusions from enquiries.</p> <p>Suggest how findings could be reported.</p> <p>Suggest possible improvements or further questions to investigate.</p>	<p>Report on findings from enquiries, including oral and written explanations, of results and conclusions.</p> <p>Report on findings from enquiries using displays or presentations.</p> <p>Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Use straight forward scientific evidence to answer questions or to support their findings.</p> <p>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p>	<p>Report and present findings from enquiries, including conclusions and (with prompting) suggest causal relationships.</p> <p>With support, present findings from enquiries orally and in writing.</p> <p>Suggest further comparative or fair tests.</p>	<p>Report and present findings from enquiries, including conclusions and suggest causal relationships.</p> <p>Report and present findings from enquiries in oral and written forms such as displays and other presentations.</p> <p>Report and present findings from enquiries, including explanations of (and degree of) trust in results.</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Use test results to make predictions to set up further comparative and fair tests.</p>

# Coverage of the areas of Science

## Year 1

• Plants:	9 hours
• Animals, including humans:	14 hours
• Everyday materials:	14 hours
• Seasonal changes:	3 hours

## Year 2

• Living things and their habitats:	15 hours
• Plants:	10 hours
• Animals, including humans:	10 hours
• Uses of everyday materials:	10 hours
• Electricity:	5 hours

Physics



Chemistry



Biology



## Year 3

• Plants:	10 hours
• Animals, including humans:	10 hours
• Rocks:	5 hours
• Light:	10 hours
• Forces and magnets:	10 hours

## Year 4

• Living things and their habitats:	10 hours
• Animals, including humans:	10 hours
• States of matter:	10 hours
• Sound:	5 hours
• Electricity:	10 hours

## Year 5

• Living things and their habitats:	10 hours
• Animals, including humans:	5 hours
• Properties and changes of materials:	15 hours
• Earth and space:	5 hours
• Forces:	10 hours

## Year 6

• Living things and their habitats:	15 hours
• Animals, including humans:	10 hours
• Evolution and inheritance:	10 hours
• Light:	5 hours
• Electricity:	5 hours



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**Curriculum**

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