

# WHOLE SCHOOL OVERVIEW

There are not six topics to a year group to allow each topic to be taught in depth so all children have a strong understanding of each area in Science.

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
1	Seasonal changes	Plants	Animals including humans			Everyday materials
2	Plants	Use of everyday materials			Animals including humans	Living things and their habitat
3	Forces and Magnets		Rocks	Animals Including Humans	Plants	Light
4	Electricity	States of matter	Animals including humans	sound		Living things and their habitat
5	Living things and their habitats	Properties and changes of materials	Earth and Space	Properties and changes of materials	Forces	Animals including humans
6	Light	Evolution and inheritance	Electricity	Animals including humans	Living things and their habitats	



# Progression in Science

Ensuring complete coverage of  
the curriculum



# Seasonal Changes

Year 1	<ul style="list-style-type: none"><li>- observe changes across the 4 seasons</li><li>- observe and describe weather associated with the seasons and how day length varies</li></ul> <p>This topic should continue throughout the school year to allow for observations</p> <p><u>Opportunities for working scientifically:</u></p> <p>asking simple questions and recognising that they can be answered in different ways – observing the changes and recording findings/observations in different ways.</p> <p>observing closely, using simple equipment – comparing how the seasons change</p> <p>identifying and classifying – the specific things linked to each season</p> <p>using their observations and ideas to suggest answers to questions</p> <p>gathering and recording data to help in answering questions</p>
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# Plants

<p>Year 1</p>	<ul style="list-style-type: none"> <li>- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>- Identify and describe the basic structure of a variety of common flowering plants, including trees</li> </ul> <p><u>Opportunities for working scientifically:</u>          Observing closely using simple equipment and identifying and classifying - collecting and sorting plants          Observing closely using simple equipment – dissecting plants</p>
<p>Year 2</p>	<ul style="list-style-type: none"> <li>- Observe and describe how seeds and bulbs grow into mature plants</li> <li>- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</li> </ul> <p><u>Opportunities for Working Scientifically:</u>          Observing closely using simple equipment – monitoring the growth of plants          Gathering and recording data – monitoring plants growing          Using observations and ideas to suggest ideas to questions – how do plants grow? What do plants need to grow investigations.</p>
<p>Year 3</p>	<ul style="list-style-type: none"> <li>- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</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.</li> <li>- Investigate the way in which water is transported within plants.</li> <li>- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul> <p><u>Opportunities for Working Scientifically:</u>          Setting up simple practical enquiry – exploring what plants need – investigating conditions needed.          Gathering, recording, classifying and presenting data in a variety of ways</p>

# ANIMALS INCLUDING HUMANS

<p>Year 1</p>	<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</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</li> </ul> <p><u>Opportunities for working scientifically</u> Asking simple questions and recognising that they can be answered in different ways Identifying and classifying – sorting common animals</p>
<p>Year 2</p>	<ul style="list-style-type: none"> <li>- notice that animals, including humans, have offspring which grow into adults</li> <li>- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</li> </ul> <p><u>Opportunities for working scientifically</u> Using their observations and ideas to suggest answers to questions – comparing humans at different ages Performing simple tests – testing to support importance of exercise and a good diet Gathering and recording data to help in answering questions – using data from simple tests on exercise</p>
<p>Year 3</p>	<ul style="list-style-type: none"> <li>- 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</li> <li>- identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> </ul> <p><u>Opportunities for working scientifically</u> Asking relevant questions and using different types of scientific enquiry – nutrition, skeletons etc Identifying differences, similarities or changes related to simple scientific ideas and processes Using straightforward scientific evidence to answer questions or to support their findings.</p>
<p>Year 4</p>	<ul style="list-style-type: none"> <li>- describe the simple functions of the basic parts of the digestive system in humans</li> <li>- identify the different types of teeth in humans and their simple functions</li> <li>- construct and interpret a variety of food chains, identifying producers, predators and prey</li> </ul> <p><u>Opportunities for working scientifically</u> Identifying differences, similarities or changes related to simple scientific ideas and processes Using straightforward scientific evidence to answer questions or to support their findings. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p>
<p>Year 5</p>	<ul style="list-style-type: none"> <li>- describe the changes as humans develop to old age</li> </ul> <p><u>Opportunities for working scientifically</u> reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations</p>
<p>Year 6</p>	<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</li> <li>- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>- describe the ways in which nutrients and water are transported within animals, including humans</li> </ul> <p><u>Opportunities for working scientifically</u> planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p>



# Evolution and Inheritance

Year 6

Links  
with  
Animals  
including  
Humans

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Opportunities for working scientifically:

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations

Identifying scientific evidence that has been used to support or refute ideas or arguments



# Everyday Materials

<p>Year 1</p>	<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</li> <li>- compare and group together a variety of everyday materials on the basis of their simple physical properties</li> </ul> <p><u>Opportunities for working scientifically:</u>          Observing closely, using simple equipment – identifying what objects are made from performing simple tests – testing properties of materials to identify most suitable for a given job          Identifying and classifying – physical properties of materials to group and compare using their observations and ideas to suggest answers to questions and gathering and recording data to help in answering questions – which material is suitable for given purpose?</p>
<p>Year 2</p>	<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</li> <li>- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</li> </ul> <p><u>Opportunities for working scientifically:</u>          Asking simple questions and recognising that they can be answered in different ways – looking at the suitability of materials.          Observing closely, using simple equipment – testing materials for changes          Performing simple tests – how to see if objects can change shape          Identifying and classifying – properties including whether they can be squashed, bent, twisted etc.          Gathering and recording data to help in answering questions – testing suitability and recording findings.</p>
<p>Year 3- Rocks</p>	<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</li> <li>- describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>- recognise that soils are made from rocks and organic matter</li> </ul> <p><u>Opportunities for working scientifically:</u>          asking relevant questions and using different types of scientific enquiries to answer them – comparing and grouping rocks          gathering, recording, classifying and presenting data in a variety of ways to help in answering questions – comparing and grouping rocks, looking at soil samples – use of microscopes.</p>

## Year 4 States of Matter

- compare and group materials together, according to whether they are solids, liquids or gases
- 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 (°C)
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

### Opportunities for working scientifically:

asking relevant questions and using different types of scientific enquiries to answer them – comparing and grouping materials.

setting up simple practical enquiries, comparative and fair tests – testing how materials change state

gathering, recording, classifying and presenting data in a variety of ways to help in answering questions – using data from testing states of matter.

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

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

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

## Year 5 properties and changes of materials

- 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
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- 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

### Opportunities for working scientifically:

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary – dissolving and reversing Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations

Identifying scientific evidence that has been used to support or refute ideas or arguments



# Living things and their habitat

<p>Year 2</p>	<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</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</li> <li>- identify and name a variety of plants and animals in their habitats, including microhabitats</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</li> </ul> <p><u>Opportunities for working scientifically:</u>          Asking simple questions and recognising that they can be answered in different ways          – comparing living, dead and never alive          Observing closely, using simple equipment – creating habitats and comparing habitats          Identifying and classifying – creating food chains          Gathering and recording data to help in answering questions</p>
<p>Year 4</p>	<ul style="list-style-type: none"> <li>- recognise that living things can be grouped in a variety of ways</li> <li>- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>- recognise that environments can change and that this can sometimes pose dangers to living things</li> </ul> <p><u>Opportunities for working scientifically:</u>          asking relevant questions and using different types of scientific enquiries to answer them          gathering, recording, classifying and presenting data in a variety of ways to help in answering questions – creating classification keys          recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables – changes to an environment          identifying differences, similarities or changes related to simple scientific ideas and processes          using straightforward scientific evidence to answer questions or to support their findings.</p>
<p>Year 5</p>	<ul style="list-style-type: none"> <li>- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>- describe the life process of reproduction in some plants and animals</li> </ul> <p><u>Opportunities for working scientifically:</u>          identifying scientific evidence that has been used to support or refute ideas or arguments – comparing life cycles and how they differ.</p>
<p>Year 6</p>	<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 micro-organisms, plants and animals</li> <li>- give reasons for classifying plants and animals based on specific characteristics</li> </ul> <p><u>Opportunities for working scientifically:</u>          identifying scientific evidence that has been used to support or refute ideas or arguments</p>



# Light

## Year 3

- recognise that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by an opaque object
- find patterns in the way that the size of shadows change

Opportunities for working scientifically:

Asking relevant questions and using different types of scientific enquiries to answer them

Setting up simple practical enquiries, comparative and fair tests

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

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

## Year 6

- recognise that light appears to travel in straight lines
- 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
- 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
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Opportunities for working scientifically:

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate – explaining why shadows are the same shape through testing different objects.

reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations

# Forces and Magnets

## Year 3

- compare how things move on different surfaces
- notice that some forces need contact between 2 objects, but magnetic forces can act at a distance
- 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 2 poles
- predict whether 2 magnets will attract or repel each other, depending on which poles are facing

Opportunities for working scientifically:

Setting up simple practical enquiries, comparative and fair tests  
 Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers  
 Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions  
 Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables  
 Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions  
 Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions  
 Identifying differences, similarities or changes related to simple scientific ideas and processes

## Year 5 - Forces only

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

Opportunities for working scientifically:

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary  
 Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate  
 Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs  
 Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations



# Sound

## Year 4

- identify how sounds are made, associating some of them with something vibrating
- recognise that vibrations from sounds travel through a medium to the ear
- find patterns between the pitch of a sound and features of the object that produced it
- find patterns between the volume of a sound and the strength of the vibrations that produced it
- recognise that sounds get fainter as the distance from the sound source increases

### Opportunities for working scientifically:

Asking relevant questions and using different types of scientific enquiries to answer them – use these questions to base investigations on

Setting up simple practical enquiries, comparative and fair tests – feeling vibrations Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers – feeling vibrations, looking at how well sound travels through different materials.

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions – same as above

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

using results to draw simple conclusions, make predictions for new values, suggest

Improvements and raise further questions

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

Using straightforward scientific evidence to answer questions or to support their findings.

# Electricity

## Year 4

- 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

### Opportunities for working scientifically:

Setting up simple practical enquiries, comparative and fair tests – complete circuits  
 Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers – looking at why the lamp is/not lighting up.  
 Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions  
 Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables – creating circuits, diagrams of complete circuits.  
 Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions  
 Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions  
 Identifying differences, similarities or changes related to simple scientific ideas and processes  
 Using straightforward scientific evidence to answer questions or to support their findings.

## Year 6

- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- 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
- use recognised symbols when representing a simple circuit in a diagram

### Opportunities for working scientifically:

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary  
 Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate  
 Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs



# Earth and Space

## Year 5

- describe the movement of the Earth and other planets relative to the sun in the solar system
- describe the movement of the moon relative to the Earth
- describe the sun, Earth and moon as approximately spherical bodies
- use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

### Opportunities for working scientifically:

Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations

Identifying scientific evidence that has been used to support or refute ideas or arguments

## Progression of skills in working scientifically

	Year 1	Year 2
Asking simple questions and recognising they can be answered in different ways	Is.....waterproof? Is a tiger a carnivore?	Explain how you know.....is waterproof? How do you know a tiger is a carnivore?
Observing closely using simple equipment	Teachers gives/guides choices of equipment Detail of observation – guided	Child led choice of equipment Detail of observation – child led
Performing simple tests	Given equipment and instructions	Given equipment Create own instructions
Identifying and classifying	Sorting 0 given categories Given materials	Child choses categories Choose materials
Use observations and ideas to suggest answers to questions	Generalisations	Use observations as evidence
Gather and record data to help in answering questions	Pictograms Accuracy of measurement Adult led	Bar chart Scales of charts Child led recording Given data to analyse

## Progression of skills in working scientifically

	Year 3	Year 4
Asking relevant questions and using different types of scientific enquiries to answer them	Ask scientific questions, answer with support. Teacher led/demonstrated	Investigate to reach the answer more independently. Choose which type of enquiry (limited range)
Setting up simple practical enquiries comparative and fair tests	Introduce the vocab and content of fair test. Set up enquiries with help	Decide when to use a fair test and understand
Making systematic and careful observations and where appropriate taking accurate measurement using standard units, range of equipment including thermometers and data loggers	Pictorial observations (labelled) or verbal responses recorded by teacher. Given the correct equipment and modelled	Pictorial and written observations Choose the appropriate equipment
Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	Bar charts/Venn diagram ~Keys for classifying and grouping (Geog link mapping) Told how to present their data (guided)	Decide how to collect data Choose how to present Ask further questions based on data.
Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	Labelled diagrams and drawings Bar charts and tables	Labelled diagrams and drawings Bar charts and tables
Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Introduce secondary source and compare introduce a range of presentation skills (bar, tally) Guidance on methods but a lot more verbal explanations and conclusions	Make decisions of how to record. Drawing conclusions and beginning to make links.
Using results to draw simple conclusions, make predictions	Record and explain results Use results to make basic conclusions Use conclusions to ask more questions	Suggest new questions to research Predicting results for alternative investigations Improving investigations through reflections
Identifying differences similarities or changes related to simple scientific ideas and processes	Cover vocab (differences, sim changes) Identifying ways in which ideas/topics are different or similar and why Could we change process to improve?	Raise questions as to why we have similarities/differences Why and how we could change processes
Using straight forward scientific evidence to answer questions or to support their findings	Use a range of sources to answer questions Communicate findings using evidence	And clarify or justify reasons or results Using an appropriate method and language

## Progression of skills in working scientifically

	Year 5	Year 6
Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	Plan investigations – introduce types of variables	Variables – planning own variables and ask open ended opportunities.
Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	Choose equipment – with guidance, purpose – understanding the purpose of investigations.	Choose equipment with greater understanding of purpose, use and accuracy of reading measurements and outcomes/ conclusion – following the investigation
Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	Share ways of recording data – pros and cons Modelling – recording data	Scatter graphs Understanding pros and cons and choosing their own method of presenting findings.
Using test results to make predictions to set up further comparative and fair tests	Guidance and findings – led and modelled by teacher – but enhanced through questioning to develop deeper understanding.	Use knowledge to independently make predictions, set up and carry investigation Articulate their understanding/reasoning. Applying their understanding and reasoning to other contexts using their routines.
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	Record and explain findings	Explain with reinforcing their understanding.
Identifying scientific evidence that has been used to support or refute ideas or arguments.	Research – discuss – justify/ compare/analyse	Researching and justifying with arrange of sources, open up investigations to prove or disprove theories.