



The Ribblesdale Federation of Schools

Science Curriculum Handbook B

(Updated for 2024 -2025 Curriculum)

Year Groups	Year A						Year B					
	1	2	3	4	5	6	1	2	3	4	5	6
Reception and Year 1	Animals including humans- Humans	Seasonal changes Focus Trees and plants	Seasonal changes Focus Trees and plants	Plants	Seasonal changes Focus Trees and plants	Everyday materials – unit 1	Animals including humans- Animals	Seasonal changes Focus British animals	Seasonal changes Focus British animals	Plants	Seasonal changes Focus British animals	Everyday materials – Unit 2
Year 2 Year 3	Animals including humans – yr 3	Electricity – Yr4	Forces and Magnetism	Y3 Sound – Yr4	Rocks – year 3	Plants – yr2	Everyday materials Y2	Light Y3	State of matter – yr 4	Living things and their habitats – yr 2	Animals including humans Y2	Plants Y3
Year 4/5/6	Earth and Space	Light Y6	Animals Including humans – yr6	Living things+ Habitats- yr4	Forces	Electric – yr6	Living things- 5	Animals including Humans - Yr4	Changes of materials	Evolution inheritance	Living things - yr6	Animals including humans - 5

Science

Intent

Science is vital to our future prosperity and it is important that our children are engaged with all aspects of science. All pupils across the Ribblesdale Federation of School will be provided with the foundations to understand the specific disciplines of biology, chemistry and physics and to develop an understanding of the world around them at an age-appropriate level.

We develop the natural excitement and curiosity of all children, including those with SEND, and inspire them to pursue scientific enquiry now and in further life. Throughout the primary years, children should learn to work scientifically by investigating, explaining and analysing phenomena, making predictions, questioning the world around them and solving problems.

Teachers nurture a love for the natural world, excitement for future possibilities in science and provide many opportunities for pupils to grow their own growth mindset and rational thinking.

Pupils with SEND

To support pupils with SEND to access a full science curriculum, we use a range of approaches which include, but are not limited to: pre-teaching scientific vocabulary; use of visual aids; scaffolding resources, such as experiment templates and writing frames; additional thinking time; additional adult support; use of technology; multi-sensory activities; alternative means to record responses; science concept cartoons; task breakdown plans; use of vocabulary mats, and; targeted questioning.

Implementation

The Curriculum –

- The National Curriculum statutory requirements are taught and assessed in each year as a basic minimum.

- Teachers are familiar with previous and subsequent year groups' content in order to link learning and build on previous knowledge.
- When planning, teachers refer to the progression document for their current topic and to the ASE PLAN resources to ensure teaching is progressive throughout school.

Timetabling –

- Science is taught discretely once per week by the class teacher.
- When there is a natural link between a science topic and other curriculum areas, teachers should endeavour to work in a cross-curricular manner e.g. to link the teaching of evolution with the history topic of Stone Age.
- Science content being covered through a cross-curricular approach must include a learning objective taken from the year group's science curriculum and recorded in the science exercise book.

Teaching –

- Teachers follow children's interests and lines of inquiry.
- Each lesson includes a working scientifically element to ensure working scientifically skills are covered over a two- year period.
- Working scientifically skills are progressive.
- Time should be taken to identify and teach the specialist vocabulary associated with each topic.
- Teaching is differentiated either by resource, support or ability grouping
- Use of open ended enquires to allow all children to access learning at their level.
- More able learners are challenged to make connections within science and to apply their knowledge to real world situations
- Teachers help to develop open mindedness in relation to scientific theories.
- Teachers aim to close the gap for PP children
- Teachers support SEN children in line with support plans. This could include;
 - Pre-teaching
 - Use of Vocabulary lists
 - Scaffolding for scientific experiments
 - Providing additional equipment to meet individuals' needs
 - Alternative methods of recording work, including the use of ICT
- Outside visitors and trips should be utilised as much as possible.
- Challenging stereotypes where possible – encouraging girls into STEM careers
- Resources made readily available to staff to carry out all lessons.
- Science topics will encompass an element of both maths and English.

- Science should refer to SMSC concerns in the modern age e.g. climate change, genetic modifications.

Assessment –

- Children rate vocabulary knowledge at the beginning and end of a topic.
- Children given the opportunity to demonstrate prior knowledge and then add to this over time and new learning occurs.
- Knowledge quiz allows the teacher to clearly see and address any misconceptions.

Impact

- Impact measured through: low-stakes quizzes; vocabulary learning; responses to open ended questions and mini assessments carried out once the topic has been completed
- Children acquire appropriate age-related knowledge.
- Children are equipped with investigative and experimenting skills.
- Children develop on learning skills - concentration, imagination, self-improvement.
- Children develop curiosity and excitement for the world around them.
- Children have a rich vocabulary to help them in science and also to access the wider curriculum.
- Children have high aspirations.
- Children are inspired to continue science learning or pursue a STEM career.
- Children develop their questioning skills.
- Children develop a strong growth mind-set.
- Children can make connections throughout the years e.g. fossils in y3 linked to evolution in y6.
- Children can confidently report and explain outcomes, both written and orally.
- Children can record findings using a range of graphs and tables.
- Children can describe methodology and accurately to allow for retesting.
- Children are prepared for science in further education and able to understand the world around them.
- Children are able to work collaboratively with peers.
- Children are aware of the SMSC concerns surrounding science in the modern age.

Cycle B

Reception and Year 1

Animals Including Humans - Animals Focus – Year 1

Outcomes for Reception and Year 1

Statutory framework for the EYFS.

Early Learning Goal.

Development Matters.

- (UTW) Children will be guided to make sense of their physical world. They will listen to a broad selection of stories, rhymes and poems to foster their understanding of the world. Children will build important knowledge, extend their familiarity with words that support understanding across domains. This will enrich and widen children's vocabulary to support later reading comprehension. **ELG: Understand some important processes and changes in the natural world around them and changing states of matter.**
- Explore the natural world around them. Children are provided with frequent opportunity for outdoor play and exploration. Children will observe and interact with natural processes such as ice melting, a sound causing a vibration, light travelling through transparent materials, an object casting a shadow, a magnet attracting an object and a boat floating on water.

Scientific Knowledge

1. Discover animal families

- Name a variety of common animals
- Identify the 5 groups of animals
- Describe the key characteristics of the 5 animal group

2. Learn about the differences between mammals and birds

- Name a variety of common birds and mammals
- Name and describe a variety of common birds and mammals
- Name, describe and compare a variety of common birds and mammals

3. Learn about the differences between amphibians, reptiles and fish

- Name a variety of common amphibians, reptiles and fish
- Name and describe a variety of common amphibians, reptiles and fish
- Name, describe and compare a variety of common amphibians, reptiles and fish

4. Discover the type of food living things eat

- Understand that animals eat different things
- Group animals based on their diet
- Explain the difference between herbivores, carnivores and omnivores

5. Explore the difference between wild animals and pets

- Know that some animals are wild and some are kept as pets
- Sort animals into those that are wild and those that are suitable for a pet

- Describe the needs of a pet

6. Explain the characteristics of an animal

- Draw and label an animal and talk about its characteristics
- Draw and label an animal and write about its characteristics
- Draw and label an animal and write about its characteristics, using some scientific language

Working Scientifically

- Grouping and sorting
- Using their observations and ideas to suggest answers to questions

Enquiry Approach

- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Research** - Using information from a variety of sources to answer scientific questions.

Enquiry Skill

- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

Seasonal Changes (Autumn) - British Animal link

Outcomes for Reception and Year 1

Statutory framework for the EYFS.

Early Learning Goal.

Development Matters.

- (UTW) Children will be guided to make sense of their physical world. They will listen to a broad selection of stories, rhymes and poems to foster their understanding of the world. Children will build important knowledge, extend their familiarity with words that support understanding across domains. This will enrich and widen children's vocabulary to support later reading comprehension. **ELG: Understand some important processes and changes in the natural world around them and changing states of matter.**
- **Explore the natural world around them.** Children are provided with frequent opportunity for outdoor play and exploration. Children will observe and interact with natural processes such as ice melting, a sound causing a vibration, light travelling through transparent materials, an object casting a shadow, a magnet attracting an object and a boat floating on water.

Scientific Knowledge

- To know about different types of weather
- To know about the seasonal features linked to Autumn.
- To know the four main seasons and how they roughly correspond with the months of year.
- To know that wind blows from different directions.
- To know what temperature is and how it can be measured.
- To know that the length of day changes throughout the day.
- To know what happens to trees and flowering plants throughout the seasons.
- To know what happens some British animals throughout the seasons.
- **Scientific skills**
 - To record information about the weather using tables and charts.
 - To observe seasonal changes and talk the similarities and differences.
 - To use equipment to record temperatures and other weather patterns.

Seasonal Changes (Winter) - British Animal link

Outcomes for Reception and Year 1

Statutory framework for the EYFS.

Early Learning Goal.

Development Matters.

- (UTW) Children will be guided to make sense of their physical world. They will listen to a broad selection of stories, rhymes and poems to foster their understanding of the world. Children will build important knowledge, extend their familiarity with words that support understanding across domains. This will enrich and widen children's vocabulary to support later reading comprehension. **ELG: Understand some important processes and changes in the natural world around them and changing states of matter.**
- **Explore the natural world around them.** Children are provided with frequent opportunity for outdoor play and exploration. Children will observe and interact with natural processes such as ice melting, a sound causing a vibration, light travelling through transparent materials, an object casting a shadow, a magnet attracting an object and a boat floating on water.

Scientific Knowledge

- To know about different types of weather
- To know about the seasonal features linked to Winter.
- To know the four main seasons and how they roughly correspond with the months of year.
- To know that wind blows from different directions.
- To know what temperature is and how it can be measured.
- To know that the length of day changes throughout the day.
- To know what happens to trees and flowering plants throughout the seasons.
- To know what happens some British animals throughout the seasons.

Scientific skills

- To record information about the weather using tables and charts.
- To observe seasonal changes and talk the similarities and differences.
- To use equipment to record temperatures and other weather patterns.

Plants

Outcomes for Reception and Year 1

Statutory framework for the EYFS.

Early Learning Goal.

Development Matters.

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- **Explore the natural world around them.** Children are provided with frequent opportunity for outdoor play and exploration. Children will observe and interact with natural processes such as ice melting, a sound causing a vibration, light travelling through transparent materials, an object casting a shadow, a magnet attracting an object and a boat floating on water.

Scientific Knowledge

1. Understand that seeds grow into plants

- Identify a plant
- Explain how to plant a seed
- Predict what might happen to their seed

2. Identify the basic parts of a plant and tree

- Say what is the same and what is different between 2 flowering plants
- Correctly label the parts of a plant
- Correctly label the parts of a tree

3. Understand that different plants can grow in the same environment

- Make careful observations
- Group plants according to their features
- Record their ideas and provide explanations

4. Know the difference between deciduous and evergreen trees

- Know that deciduous trees change throughout the year
- Explain how a deciduous tree changes through the year
- Make comparisons between a deciduous tree and an evergreen tree

5. Know that fruit trees and vegetables are varieties of plants

- Understand that plants are a source of food
- Make predictions
- Record their findings in a table

6. Record the growth of a plant

- Understand that plants grow over time
- Record the growth of a plant
- Measure the height of a plant and record how much it has grown

Working Scientifically

- Asking simple questions
- Observing closely, using simple equipment
- Using their observations and ideas to suggest answers to questions
- Identifying and classifying
- Comparing and contrasting familiar plants
- Drawing diagrams showing the parts of different plants, including trees
- Gathering and recording data
- Describing how they were able to identify and group different plants
- Comparing and contrasting what they have found out about different plants
- Observing closely

Enquiry Approach

- **Observation over time** - Observing changes that occur over a long or short period of time.
- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Research** - Using information from a variety of sources to answer scientific questions.
- **Making predictions** - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry.

Enquiry Skill

- **Making predictions** - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry.
- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings
- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Interpreting and communicating results** - Using information, results and data to present findings, including oral and written explanations.

Seasonal Changes (Spring/Summer) - British Animal link

Outcomes for Reception and Year 1

Statutory framework for the EYFS.

Early Learning Goal.

Development Matters.

- (UTW) Children will be guided to make sense of their physical world. They will listen to a broad selection of stories, rhymes and poems to foster their understanding of the world. Children will build important knowledge, extend their familiarity with words that support understanding across domains. This will enrich and widen children's vocabulary to support later reading comprehension. **ELG: Understand some important processes and changes in the natural world around them and changing states of matter.**
- **Explore the natural world around them.** Children are provided with frequent opportunity for outdoor play and exploration. Children will observe and interact with natural processes such as ice melting, a sound causing a vibration, light travelling through transparent materials, an object casting a shadow, a magnet attracting an object and a boat floating on water.

Scientific Knowledge

- To know about different types of weather
- To know about the seasonal features linked to Spring/Summer.
- To know the four main seasons and how they roughly correspond with the months of year.
- To know that wind blows from different directions.
- To know what temperature is and how it can be measured.
- To know that the length of day changes throughout the day.
- To know what happens to trees and flowering plants throughout the seasons.
- To know what happens some British animals throughout the seasons.

Scientific skills

- To record information about the weather using tables and charts.
- To observe seasonal changes and talk the similarities and differences.
- To use equipment to record temperatures and other weather patterns.

Everyday material

Outcomes for Reception and Year 1

- Statutory framework for the EYFS.
- **Early Learning Goal.**
- **Development Matters.**

- (UTW) Children will be guided to make sense of their physical world. They will listen to a broad selection of stories, rhymes and poems to foster their understanding of the world. Children will build important knowledge, extend their familiarity with words that support understanding across domains. This will enrich and widen children's vocabulary to support later reading comprehension. **ELG: Understand some important processes and changes in the natural world around them and changing states of matter.**
- **Explore the natural world around them.** Children are provided with frequent opportunity for outdoor play and exploration. Children will observe and interact with natural processes such as ice melting, a sound causing a vibration, light travelling through transparent materials, an object casting a shadow, a magnet attracting an object and a boat floating on water.

1. Identify and name a variety of everyday materials

Understand what a material is

Identify a variety of everyday materials

Describe everyday materials

2. Distinguish between an object and the material it is made from

Understand that all objects are made from materials

Identify what material an object is made from

Understand that different objects can be made from the same material

3. Describe the properties of everyday materials

Give simple descriptions of everyday materials

Describe the properties of everyday materials

Explain why materials are chosen for particular objects

4. Identify objects that are natural and those that are manmade

Understand that some materials are natural and some are manmade

Identify natural and manmade materials

Understand that natural and manmade materials are used for different purposes

5. Predict and identify if an object will float or sink

Understand that some objects float and some objects sink

Predict and identify if an object will float or sink

Predict and identify if an object will float or sink and explain if my prediction was correct

6. Explore which materials are best for different objects

Understand that some materials soak up water

Compare materials that are absorbent and not absorbent

Understand that non-absorbent materials are used in objects that need to be waterproof

Working Scientifically

- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Performing simple tests
- Gathering and recording data to help in answering questions

Enquiry Approach

- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Making predictions** - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry.
- **Setting up tests** - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.

Enquiry Skill

- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- **Comparative / fair testing** - Conducting a test that controls all but one variable to answer a scientific question.

Cycle B

Years 2 and 3

Everyday Materials – Year 2

Outcomes for years 2 and 3

Scientific Knowledge

1. Identify different materials and their uses

- Understand what a material is
- Know the properties of a variety of everyday materials
- Explain why some materials are suitable for specific uses

2. Understand how to select the right materials to build a bridge

- Understand that some materials are stronger than others
- Compare the strength of different materials
- Understand that materials differ in strength and can be strengthened by changing their structure

3. Explore and test the stretchiness of materials

- Understand that the shapes of objects can be changed by stretching
- Compare how the shapes of objects change when they are stretched
- Compare how some objects change after stretching while other objects return to their original form

4. Understand materials can change their shape by twisting, bending, squashing or stretching

- Understand that the shapes of objects can be changed by twisting, bending, squashing or stretching
- Compare how the shapes of objects change when they are twisted, bent, squashed or stretched
- Understand why bending, twisting, stretching or squashing objects is important in everyday life

5. Learn about Charles Macintosh and explore how materials are suitable for different purposes

- Know that some materials are suitable or unsuitable for particular purposes
- Understand the properties of materials that make them suitable or unsuitable for particular purposes
- Link the suitability of materials for particular purposes with the uses of everyday tools

6. Discover which materials change shape when making a road with John McAdam

- Understand that some materials can be melted
- Know that some materials can be melted to change their shape
- Know that some materials can be melted and mixed with other materials to change their properties

Working Scientifically

- Using their observations and ideas to suggest answers to questions
- Predicting, observing, investigating, measuring and recording

Enquiry Approach –

- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Setting up tests** - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.

- **Comparative / fair testing** - Conducting a test that controls all but one variable to answer a scientific question.
- **Interpreting and communicating results** - Using information, results and data to present findings, including oral and written explanations.
- **Evaluating** - Assessing the success of a scientific enquiry by evaluating the prediction, method and results and identifying further questions for enquiry.

Enquiry Skill –

- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- **Comparative / fair testing** - Conducting a test that controls all but one variable to answer a scientific question.
- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.

Light – Year 3

Outcomes for year 2 and 3

Scientific Knowledge

1. Identify the difference between light sources and non light sources

- Identify light sources
- Understand the difference between natural and artificial sources of light
- Explain why certain objects are sources of light and why others are not

2. Explore the light that comes from the sun and how to stay safe

- Understand that sunlight can damage our skin and our eyes
- Observe the effectiveness of suncream as protection against the sunlight
- Using scientific evidence, explain the effectiveness of suncream as protection against the sunlight

3. Explore materials which are reflective

- Understand that some objects are a light source and some are reflectors
- Identify materials that are good reflectors
- Explain why some materials are better reflectors than others

4. Discover how shadows are formed

- Understand that a shadow is formed when an object blocks the light
- Explain how a shadow is formed when an opaque object blocks the light
- Understand that the size of a shadow changes when it is moved further from the light

5. Investigate how shadows change throughout the day

- Understand that shadows change throughout the day
- Explain how shadows change throughout the day
- Explain how and why shadows change throughout the day

6. Investigate how you can change the size of a shadow

- Understand that the size and shape of a shadow can change
- Know how to change the size and shape of a shadow
- Explain why the size and shape of a shadow can change

Working Scientifically

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

Enquiry Approach

- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.

- **Comparative / fair testing** - Conducting a test that controls all but one variable to answer a scientific question.
- **Pattern-seeking** - Identifying patterns and looking for relationships to make links between scientific concepts.
- **Observation over time** - Observing changes that occur over a long or short period of time.

Enquiry Skill

- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- **Making predictions** - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry.
- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

States of Matter – Year 4

Outcomes for years 2 and 3

Scientific Knowledge

1. Compare and group the 3 states of matter

Identify the 3 states of matter

Describe the properties of the 3 states of matter

Classify substances based on their state of matter

2. Explore how particles behave in solids, liquids and gases

- Describe how particles behave in each state of matter

- Explain how substances change state

- State the temperature at which water changes state

3. Investigate melting points

- Understand melting points

- Observe and accurately record the temperature at which food changes state

- Predict the melting point of different foods

4. Explore freezing and boiling points

- Describe freezing and boiling points

- Create an accurate bar chart

- Research freezing and boiling points

5. Explore evaporation and condensation

- Define evaporation and condensation

- Investigate the effect of temperature on the rate of evaporation

- Raise further questions to be investigated

6. Understand the water cycle

- Order the stages of the water cycle

- Identify the importance of evaporation and condensation within the water cycle

- Describe the water cycle in detail

Working Scientifically

- Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- Using straightforward scientific evidence to answer questions or to support their findings
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units
- Using a range of equipment, including thermometers and data loggers
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

Enquiry Approach

- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Pattern-seeking** - Identifying patterns and looking for relationships to make links between scientific concepts.
- **Observation over time** - Observing changes that occur over a long or short period of time.
- **Research** - Using information from a variety of sources to answer scientific questions.
- **Comparative / fair testing** - Conducting a test that controls all but one variable to answer a scientific question.
- **Problem-solving** - Applying prior scientific knowledge to solve problems and answer further questions.

Enquiry Skill

- **Interpreting and communicating results** - Using information, results and data to present findings, including oral and written explanations.
- **Setting up tests** - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.
- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- **Making predictions** - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry.

Living Things and their Habitat – Year 2

Outcomes for years 2 and 3

Scientific Knowledge

1. Compare the differences between things that are living, dead, and things which have never been alive

- Understand that there are things that are living, dead or have never been alive
- Identify and classify objects into living, dead or never been alive
- Understand the 7 characteristics of living things

2. Identify and name a variety of plants and animals in a microhabitat

- Know the difference between a habitat and a microhabitat
- Identify and name a range of microhabitats
- Understand that living things depend on each other for survival

3. Design a suitable microhabitat where living things could survive

- Understand that living things need certain conditions to survive
- Design a microhabitat where living things could survive
- Explain why an animal may or may not be suited to certain conditions

4. Find out what animals eat to survive in their habitats

- Understand that all animals need to eat to survive
- Find out what specific animals eat through research
- Ask diverse questions to find out what animals eat and where they find their food

5. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain

- Explain what could affect a food chain
- Show how all animals and humans relate to each other in a food chain
- Describe what a food chain is

6. Understand the journey food makes from the farm to the supermarket

- Understand that food we eat comes from a natural source
- Identify different foods that come from the same natural source
- Explain how foods have changed from their natural source

Working Scientifically

- Identifying and classifying
- Observing closely, using simple equipment
- Using their observations and ideas to suggest answers to questions
- Asking simple questions and recognising that they can be answered in different ways
- Gathering and recording data to help in answering questions
- Sorting and grouping

Enquiry Approach

- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Research** - Using information from a variety of sources to answer scientific questions.

Enquiry Skills

- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

Animals Including Humans – Year 2

Outcomes for year 2 and 3

Scientific Knowledge

1. Notice that animals, including humans, have offspring which grow into adults

- Order the stages of a human life cycle
- Identify each stage of a human life cycle
- Draw the human life cycle

2. Describe the stages of life from adulthood to old age

- Match descriptions of each stage of the human life cycle
- Describe each stage of the human life cycle
- Compare two stages of the human life cycle

3. Learn how to match offspring to their parent

- Match offspring with their parents
- Identify features inherited from a parent
- Explain why some animals are more challenging to match

4. Explore the life cycle of a chicken

- Compare the life cycle of a chicken and a human
- Create a bar chart
- Predict the height of a chick

5. Describe the life cycle of a butterfly

- Name the different stages of a butterfly's life
- Describe how a butterfly moves between the stages in its life cycle
- Explain the life cycle of a butterfly and the process of metamorphosis

6. Explore the life cycle of a frog

- Name the stages of a frog's life cycle
- Describe how a frog moves between the stages in its life cycle
- Compare some similarities and differences between the life cycle of a frog and other animal

Working Scientifically

- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Gathering and recording data to help in answering questions

Enquiry Approach

- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Research** - Using information from a variety of sources to answer scientific questions.

- **Pattern-seeking** - Identifying patterns and looking for relationships to make links between scientific concepts.

Enquiry Skill

- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings
- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

Plants - Year 3

Outcomes for years 2 and 3

1. Compare the effect of different factors on plant growth

- Plan and set up an experiment that compares the effect of different factors on the growth of a plant
- Set up a fair test
- Ask scientific questions and suggest different ways to answer them

2. Describe the functions of different parts of a flowering plant and how they are used in photosynthesis

Identify the parts of a plant

Draw and label a diagram to show the parts of a plant

Describe the functions of a flowering plant

3. Investigate the way in which water is transported within plants

- Understand how water is transported within plants
- Create an observational drawing to show how water is transported through a plant
- Describe how water is transported through a plant

4. Explore the part that flowers play in the life cycle of flowering plants

- Identify the reproductive parts in a flower
- Explain the functions of the reproductive parts in a flower
- Explain how flowering plants reproduce

5. Understand the pollination process and the ways in which seeds are dispersed

Understand that seed dispersal is a way in which some plants reproduce

Provide an explanation, both written and verbal, to show how plants reproduce

Use scientific language to describe how plants reproduce

Working Scientifically

- Asking relevant questions and using different types of scientific enquiries to answer them
- Setting up simple practical enquiries and comparative and fair tests
- Making systematic and careful observations
- Reporting on findings from enquiries, including oral and written explanations
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

Enquiry Skill

- **Asking questions** - Asking relevant questions that can be answered from their learning of scientific concepts. This may be through scientific enquiries, applying prior knowledge or research.
- **Research** - Using information from a variety of sources to answer scientific questions
- **Observation over time** - Observing changes that occur over a long or short period of time.

Enquiry Approach

- **Comparative / fair testing** - conducting a test that controls all but one variable to answer a scientific question
- **Interpreting and communicating results** - Using information, results and data to present findings, including oral and written explanations.
- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.

Cycle B

Years 4, 5 and 6

Animals including Humans – Year 5

Outcomes for years 4,5 and 6

Scientific Knowledge -

1. Identify the key stages of a mammal's life cycle

- Name the key stages of a mammal's life cycle
- Identify developments during each stage of a life cycle
- Compare the human life cycle with another mammal

2. Explore the gestation periods of mammals

- Understand what gestation is
- Learn some differences between the gestation periods of mammals
- Explore reasons behind extreme gestation periods

3. Learn about foetal development

- Understand the stages during pregnancy
- Accurately create and plot points on a line graph
- Compare the mass and length lines

4. Investigate the hand span of differently aged children

- Understand all children grow
- Learn some ways that the growth of children is measured
- Begin to link data with scientific thinking on growth

5. Learn about the changes experienced in puberty

- Understand all children go through puberty
- Identify changes that take place during puberty
- Compare the changes experienced by boys and girls

6. Describe the changes humans may experience during old age

- Know some key signs of ageing in humans
- Recognise that humans age differently depending on their lifestyle
- Suggest ways to stay healthy in old age

Working Scientifically –

- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs and 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
- Taking measurements using a range of scientific equipment and with increasing accuracy and precision; taking repeat readings when appropriate
- Identifying scientific evidence that has been used to support or refute ideas or arguments

Enquiry Approach –

Observing changes - that occur over a long or short period of time.

Research -Using information from a variety of sources to answer scientific questions.

Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts

Comparative / fair testing- Conducting a test that controls all but one variable to answer a scientific question.

Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.

Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions.

Enquiry Skill –

Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings

Interpreting and communicating results -using information, results and data to present findings, including oral and written explanations

Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry

Animals Including Humans - Year 4

Outcomes for years 4,5 and 6

Scientific Knowledge

1. Identify the organs in the digestive system

- Identify the main organs of the human digestive system
- Create an accurate diagram of the main organs of the human digestive system
- Explain the role of the digestive system and the organs within it

2. Describe the functions of the main organs in the digestive system

- Describe the functions of the organs in the digestive system
- Use a model of the digestive system to explain the journey of food
- Explain how the equipment used in the model relates to the digestive system

3. Identify the types of human teeth and their functions

- Identify the different types of human teeth
- Explain the functions of the different types of human teeth
- Explain why humans have 2 sets of human teeth

4. Investigate the effects of different liquids on the teeth

- Observe and record the effect of each liquid
- Draw conclusions from the investigation
- Explain how to care for your teeth

5. Understand food chains

- Identify the key parts of a food chain
- Create a food chain within a chosen ecosystem
- Explain why it is important to keep food chains balanced

6. Explore food webs

- Research living things within a chosen ecosystem
- Create a food web for a chosen ecosystem
- Identify threats to living things within their chosen ecosystem

Scientific Skills

- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units
- Setting up simple practical enquiries and comparative and fair tests
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables
- Reporting on findings from enquiries, including oral and written explanations
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

Enquiry Approach

- **Pattern Seeking** - Identifying patterns and looking for relationships to make links between scientific concepts.
- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Comparative / fair testing** - Conducting a test that controls all but one variable to answer a scientific question
- **Research** - Using information from a variety of sources to answer scientific questions.

Enquiry Skill –

- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- **Interpreting and communicating results** - Using information, results and data to present findings, including oral and written explanations.
- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry

Changes in Materials - Year 5

Outcomes for years 4,5 and 6

Scientific Knowledge

1. Use evaporation to recover the solute from a solution

- Describe how evaporation can be used to get the salt back from salty water
- Use the results of an evaporation experiment to explain which mystery liquid is a solution
- Suggest a method to recover the water from a salt water solution and explain why this method works

2. Recognise and describe reversible changes

- Identify methods for reversing a physical change
- Describe how the method used to reverse a physical change works
- Evaluate the strengths and weaknesses of the method chosen and suggest improvements

3. Observe chemical reactions and describe how we know new materials are made

- Name some irreversible changes
- Use observations to describe how you can tell an irreversible change has taken place
- Explain why the change is irreversible and what new products have been made

4. Investigate rusting reactions

- Identify rusting as an irreversible change
- Plan an experiment to investigate rusting and include how to make it a fair test
- Explain why rusting is an irreversible change, why it is a problem and how to prevent it

5. Investigate burning reactions

- Identify the 3 factors a fire needs to burn
- Describe and explain different methods for extinguishing a fire
- Apply knowledge of the fire triangle to alternative extinguishing methods

6. Investigate chemical reactions - acids and bicarbonate of soda

- Predict the best substances used to make the fizzy rocket
- Use experiment results to test a prediction and write a conclusion to show the best substances to make a fizzy rocket
- Use measuring equipment to suggest ways to improve the accuracy of the observations made in the experiment

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
- Planning different types of scientific enquiry to answer questions, including recognising and controlling variables where necessary
- Identifying scientific evidence that has been used to support or refute ideas or arguments

Enquiry Approach

Observation over time - Observing changes that occur over a long or short period of time.

Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions

Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question.

Enquiry Skill

Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.

Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations.

Evolution and Inheritance – Year 6

Outcomes for years 4,5 and 6

Scientific Knowledge

1. Understand how offspring vary and are not identical to their parents
 - Understand that some characteristics are inherited
 - Explain why offspring look similar but not identical to their parents
 - Understand that variations in species can be due to environmental factors

2. Learn about animal adaptations

- Describe how an animal is adapted to its environment
- Explain how an animal's adaptation helps it to survive in the habitat
- Predict how an animal would have to adapt to suit a different habitat

3. Learn about plant adaptations

- Describe how a plant is adapted to its environment
- Explain how a plant's adaptation helps it to survive in the habitat
- Create a new plant that is perfectly adapted to survive in a habitat

4. Explore what we can learn from fossils

- Understand that fossils provide information about living things that are now extinct
- Using evidence from fossils, compare extinct animals with those that are living and identify adaptations
- Use evidence from fossils to suggest some conclusions about life in the past

5. Explore the theory of evolution by natural selection

- Identify how living things have changed over time
- Describe how natural selection causes living things to evolve over time
- Explain why the theory of evolution was not accepted at first

6. Explore human evolution

- Identify differences in human ancestors
- Describe how humans have evolved
- Compare and contrast Neanderthals and homo sapiens

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

Enquiry Approach

- **Problem-solving**- Applying prior scientific knowledge to solve problems and answer further questions.
- **Research** - Using information from a variety of sources to answer scientific questions.

Enquiry Skill

- **Interpreting and communicating results** - Using information, results and data to present findings, including oral and written explanations.
- **Asking questions** - Asking relevant questions that can be answered from their learning of scientific concepts. This may be through scientific enquiries, applying prior knowledge or research.
- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

Living Things and their Habitats – Year 6

Outcomes for years 4,5 and 6

Scientific Enquiry

1. Classify living organisms

- Explain how living things are classified by designing their own chart and comparing their size
- Describe how to classify a range of living animals and plants
- Identify ways to differentiate living things

2. Understand the kingdoms of life

- Explain a key feature or member of each animal kingdom
- Understand MRS GREN and how a living organism follows these rules
- Know that living organisms can be arranged into kingdoms

3. Classify living things using the Linnaean system

- Explain how different organisms can be classified using the Linnaean system
- Understand how an animal can be classified depending on its characteristics
- Use research to help classify a living organism

4. Identify the characteristics of different types of microorganisms

- Represent research and data in a creative way to summarise knowledge
- Know and explain that microorganisms are both helpful and harmful
- Understand that microorganisms are microscopic and cannot be seen with the naked eye

5. Investigate asexual reproduction through spore dispersal

- Explain the differences between fungi and other organisms
- Outline the similarities between plants and fungi
- Identify that fungi are a separate kingdom to plants

6. Classify and describe a living organism

Describe, represent and present data about a living organism

Describe and represent data about a member of the animal kingdom

Represent data about a member of the animal kingdom

Working Scientifically

- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs and bar and line graphs
- Identifying scientific evidence that has been used to support or refute ideas or arguments
- 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 and taking repeat readings when appropriate
- 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.

Enquiry Approach

- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Research** - Using information from a variety of sources to answer scientific questions.
- **Comparative / fair testing** - Conducting a test that controls all but one variable to answer a scientific question.
- **Observation over time** - Observing changes that occur over a long or short period of time.
- **Problem-solving** - Applying prior scientific knowledge to solve problems and answer further questions.

Enquiry Skill

- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- **Interpreting and communicating results** - Using information, results and data to present findings, including oral and written explanations.
- **Setting up tests** - carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.
- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

Living things and their Habitats – Year 5

Outcomes for years 4,5 and 6

Scientific Knowledge

1. Understand the life processes of a plant

- Understand what plants need to grow strong and healthy
- Understand that plants can reproduce sexually and asexually
- Understand that plants are living things

2. Understand the life cycles of mammals

- Understand that not all mammals have the same life cycle
- Know the 3 types of mammal
- Understand what a life cycle is

3. Compare the life cycles of insects and amphibians

- Understand the life cycle of an amphibian
- Understand the life cycle of an insect
- Compare the process of metamorphosis in amphibians and insects

4. Understand the life cycle of birds and reptiles

Recall key facts about the structure of an egg

Describe the differences between a mammal and a bird or reptile life cycle

Understand the life cycle of birds and reptiles

5. Know about the life and work of Jane Goodall and David Attenborough

Understand the importance of documenting living things and highlighting their decline in the world

Identify important facts about 2 key members of the scientific community

Understand the importance of studying living organisms

6. Research and present the life cycle of a creature

Suggest ideas for conservation of living or imaginary life

Represent key information about a chosen living organism

Represent knowledge learnt about life cycles

Working Scientifically

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- 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
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision and taking repeat readings when appropriate

Enquiry Approach

- **Pattern-seeking** - Identifying patterns and looking for relationships to make links between scientific concepts.
- **Identifying, grouping & classifying** - Using observations, data and findings to name, label and organise items in a variety of ways.
- **Observation over time** - Observing changes that occur over a long or short period of time.
- **Research** - Using information from a variety of sources to answer scientific questions
- **Problem-solving** - Applying prior scientific knowledge to solve problems and answer further questions.

Enquiry Skill

- **Making prediction** - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry.
- **Interpreting and communicating results** - Using information, results and data to present findings, including oral and written explanations.
- **Recording data, results and findings** - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- **Observing and measuring** - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.