Curriculum Handbook for Science

St Mary's C of E Primary Academy

"For I know the plans I have for you," declares the Lord, "plans to prosper you and not to harm you, plans to give you a hope and a future." Jeremiah 29:11

Identity. Community. Heritage.

A curriculum that tells our story.

At St Mary's, our curriculum is shaped by the richness of our identity, the strength of our community, and the depth of our heritage. These values are rooted in our theological vision:

"At the heart of our community, we serve to embrace lifelong learning through our Christian foundations. We step forward with love in our hearts, peace in our actions and hope in our aspirations. We enable all to; flourish in our diversity of faith and belief, be ambitious and be our unique selves."

This theological vision flows directly into our whole-school curriculum intent, guiding both what we teach and how we teach it:

"St Mary's curriculum is built upon content that reflects our community's identity, culture and heritage, promoting inclusivity and empowering our children to tell their own stories. We are dedicated to preparing children for the future by fostering a foundation of Christian values, ensuring they step forward with love in their hearts, peace in their actions and hope in their aspirations, embracing the journey of lifelong learning."

Each subject contributes to a curriculum that reflects the culture and stories of our children, promotes inclusion, and empowers every learner to understand who they are, where they belong, and what they can become.

As promised in *Jeremiah 29:11*:
"For I know the plans I have for you," declares the Lord, "plans to prosper you and not to harm you, plans to give you a hope and a future."

With this hope, we prepare our children not just for school, but for life -grounded in love, rooted in purpose, and confident in their own unfolding story.

St Mary's C of E Primary Academy – Whole School Science Policy

Intent

At St Mary's, our Science curriculum is built upon our whole school vision and curriculum intent: reflecting our community's identity, culture and heritage, promoting inclusivity, and empowering all children to tell their own stories. Through a high-quality, knowledge-rich Science curriculum, we aim to prepare children for their future by equipping them with the skills, curiosity and critical thinking needed to understand the world around them.

We believe Science is a vehicle for promoting awe and wonder, building resilience and collaboration, and celebrating diversity. Rooted in Christian values, our Science teaching encourages children to care for God's creation, act responsibly, and engage with learning with hope in their aspirations, love for discovery, and peace in their actions.

Our curriculum ensures:

- Children learn scientific knowledge and concepts through a well-sequenced and progressive curriculum.
- Learners of all backgrounds and abilities have full access to a rich and inclusive Science education.
- Vocabulary is explicitly taught to support all learners to speak and think scientifically, reducing barriers to learning.
- Children understand how science connects with real life, including local environmental issues and future careers.
- Working scientifically skills are embedded and progressive, allowing children to investigate, observe, ask questions, and draw conclusions confidently.

Implementation

At St Mary's, we implement our Science curriculum through a consistent and structured approach that promotes clarity, progression, and accessibility for all learners:

Structure and Delivery

- Science is taught twice weekly in Years 1–6.
    - A **short "familiarise" session** explicitly teaches key vocabulary and revisits prior knowledge. These sessions are designed to close gaps, strengthen schema, and ensure all children can access learning.
    - A **core one-hour Science lesson** follows the adapted *Plan Bee* scheme. These lessons are aligned to the National Curriculum and our school's knowledge-led approach.
- In the EYFS, Science is delivered through *Understanding the World* using *Development Matters*, enriched with oral hygiene teaching and topic-based learning.
- All Science lessons are underpinned by Rosenshine's Principles of Instruction and *WalkThrus* pedagogy, with a balance of practical, investigative and knowledge-based learning.
- Each lesson identifies the *field of science* (biology, chemistry or physics) so children develop disciplinary awareness.
- Staff use our bespoke progression map to ensure appropriate pitch and avoid repetition. The map builds on prior knowledge, promotes deep learning, and ensures children *know more and can do more* over time.
- The school grounds and local context are used wherever possible to bring Science learning to life and connect it to the children's heritage and lived experiences.
- High-quality planning, slides and resources are provided to reduce workload and ensure consistency.

Inclusion and Support

- Lessons are adapted to meet the needs of all learners, including those with SEND and EAL, by focusing on vocabulary and pre-teaching where needed.
- Scientific vocabulary is introduced gradually and taught explicitly through the *familiarise* sessions and classroom displays.
- Children are supported to speak in full sentences and use scientific language in discussions and written work.

Impact

The impact of our Science curriculum is seen in how children *speak, think and behave* like scientists, demonstrating curiosity, confidence and care for the world around them.

Assessment

- Formative assessment takes place during lessons through questioning, discussion, and practical tasks.
- Summative assessment includes:
    - End-of-topic quizzes and tasks recorded in books.
    - Completion of assessment grids after each lesson.
    - Data logged termly on *Insight* to monitor individual and group progress.
- These outcomes help identify misconceptions and inform teaching.

Monitoring and Evaluation

Science is regularly monitored through:

- Learning walks
- Pupil Book Studies
- Pupil and staff voice
- Staff feedback

St Mary's C of E Primary Academy Science
Curriculum Unit Overview

EYFS	All about Me	Let's Celebrate	Amazing Animals	Come Outside	Are we Nearly there yet/Fun at the Seaside
Year 1	Identifying Plants	Identifying animals	My Body	Everyday materials	Seasonal changes
Year 2	Living in Habitats	Growing Plants	Growth and survival	Exploring Everyday Materials	Super Scientists
Year 3	How Plants Grow	Health and Movement	Rocks, Fossils and Soils	Light and Shadow	Forces and Magnets
Year 4	Living in Environments	Eating and Digestion	States of Matter	Changing Sound	Circuits and Conductors
Year 5	Life Cycles	Changes and Reproduction	Properties and Changes of Materials	Earth and Space	Forces in Action
Year 6	Classifying Organisms	Healthy Bodies	Evolution and Inheritance	Seeing Light	Changing Circuits

Science Learning Intent

EYFS Objectives	Schemes of Work				
	All About Me	Let's Celebrate	Amazing Animals	Come Outside	Are we nearly there yet?/Fun at the Seaside
Communication and Language					
• Learn new vocabulary.	✓	✓	✓	✓	✓
• Ask questions to find out more and to check what has been said to them.	✓	✓	✓	✓	✓
• Articulate their ideas and thoughts in well-formed sentences.	✓	✓	✓	✓	✓
• Describe events in some detail.	✓	✓	✓	✓	✓
• Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.	✓	✓	✓	✓	✓
• Use new vocabulary in different contexts	✓	✓	✓	✓	✓
Personal, Social and Emotional Development • Know and talk about the different factors that support their overall health and wellbeing:					
- regular physical activity	✓				✓
- healthy eating	✓	✓			
- toothbrushing	✓				

Understanding the World					
• Explore the natural world around them.			✓	✓	✓
• Describe what they see, hear and feel while they are outside			✓	✓	✓
• Recognise some environments that are different to the one in which they live.	✓	✓	✓	✓	✓
• Understand the effect of changing seasons on the natural world around them.		✓		✓	✓
Early Learning Goals					
• Make comments about what they have heard and ask questions to clarify their understanding.	✓	✓	✓	✓	✓
• Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.	✓	✓			
•					
• Explore the natural world around them, making observations and drawing pictures of animals and plants.			✓	✓	✓

• Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.			✓	✓	✓
• Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.		✓	✓	✓	✓

Year 1 Objectives	Schemes of Work				
	Identifying Plants	Identifying Animals	My Body	Everyday Materials	Seasonal Changes
asking simple questions and recognising that they can be answered in different ways	✓	✓	✓		✓
observing closely, using simple equipment	✓	✓	✓	✓	✓
performing simple tests			✓	✓	✓
identifying and classifying	✓	✓	✓	✓	✓
using their observations and ideas to suggest answers to questions	✓		✓	✓	✓
gathering and recording data to help in answering questions	✓				✓
identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	✓				
identify and describe the basic structure of a variety of common flowering plants, including trees	✓				
identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals		✓			
identify and name a variety of common animals that are carnivores, herbivores and omnivores		✓			
describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)		✓			
identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense			✓		
distinguish between an object and the material from which it is made				✓	
identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock				✓	
describe the simple physical properties of a variety of everyday materials				✓	

compare and group together a variety of everyday materials on the basis of their simple physical properties				✓	
observe changes across the four seasons					✓
observe and describe weather associated with the seasons and how day length varies					✓

Year 1 Overview Objectives	
Identifying plants	• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees
Identifying animals	• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • identifying and classifying • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
My Body	• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense

Everyday materials	• observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties
Seasonal changes	• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies

Year 2 Objectives	Schemes of Work				
	Living in Habitats	Growing Plants	Growth and Survival	Exploring Everyday Materials	Super Scientists
asking simple questions and recognising that they can be answered in different ways		✓	✓	✓	✓
observing closely, using simple equipment	✓	✓		✓	✓
performing simple tests		✓	✓	✓	✓
identifying and classifying	✓	✓	✓	✓	✓
using their observations and ideas to suggest answers to questions	✓	✓	✓	✓	✓
gathering and recording data to help in answering questions		✓	✓		
explore and compare the differences between things that are living, dead, and things that have never been alive	✓	✓			
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	✓	✓			
identify and name a variety of plants and animals in their habitats, including microhabitats	✓	✓			
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	✓				
observe and describe how seeds and bulbs grow into mature plants		✓			
find out and describe how plants need water, light and a suitable temperature to grow and stay healthy		✓			
notice that animals, including humans, have offspring which grow into adults			✓		
find out about and describe the basic needs of animals, including humans, for survival (water, food			✓		

and air)					
describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene			✓		✓
identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses				✓	
find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching				✓	

Year 2 Overview Objectives	
Living in Habitats	• observing closely, using simple equipment • identifying and classifying • using their observations and ideas to suggest answers to questions • explore and compare the differences between things that are living, dead, and things that have never been alive • 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 • identify and name a variety of plants and animals in their habitats, including micro-habitats • 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
Growing Plants	• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions • explore and compare the differences between things that are living, dead, and things that have never been alive • 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 • identify and name a variety of plants and animals in their habitats, including micro-habitats • observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy
Growth and survival	• asking simple questions and recognising that they can be answered in different ways • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions • notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Exploring Everyday Materials	• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
Super Scientists	• asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Year 3 Objectives	How Plants Grow	Forces and Magnets	Rocks, Fossils and Soils	Light and Shadow	Health and Movement
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	✓	✓		✓	✓
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	✓	✓	✓	✓	
identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	✓				
explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant	✓				
investigate the way in which water is transported within plants	✓				
explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	✓				
identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat					✓
identify that humans and some other animals have skeletons and muscles for support, protection and movement					✓

compare and group together different kinds of rocks on the basis of their appearance and simple physical properties			✓		
describe in simple terms how fossils are formed when things that have lived are trapped within rock			✓		
recognise that soils are made from rocks and organic matter			✓		
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				✓	
compare how things move on different surfaces		✓			
notice that some forces need contact between two 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 two poles		✓			
predict whether two magnets will attract or repel each other, depending on which poles are facing		✓			

Year 3 Overview Objectives	
How Plants Grow	• 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 • qathering, 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 • using straightforward scientific evidence to answer questions or to support their findings • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • investiqate the way in which water is transported within plants • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Forces and Magnets	• 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 • 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 • using straightforward scientific evidence to answer questions or to support their findings • compare how things move on different surfaces • notice that some forces need contact between two 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 two poles • predict whether two magnets will attract or repel each other, depending on which poles are facing

Year 3 Overview Objectives	
Rocks, Fossils and Soils	• 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 • 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 • using straightforward scientific evidence to answer questions or to support their findings • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter
Light and Shadow	• 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 • qathering, 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 straightforward scientific evidence to answer questions or to support their findings • 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 a solid object • find patterns in the way that the size of shadows change
Health and Movement	• 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 • 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 • identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other animals have skeletons and muscles for support, protection and movement

Year 4 Objectives	Living In Environments	Eating and Digestion	States of Matter	Changing Sound	Circuits and Conductors
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	✓	✓	✓	✓	✓
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		✓	✓	✓	
recognise that living things can be grouped in a variety of ways	✓				
explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	✓				
recognise that environments can change and that this can sometimes pose dangers to living things	✓				
describe the simple functions of the basic parts of the digestive system in humans		✓			
identify the different types of teeth in humans and their simple functions		✓			
construct and interpret a variety of food chains, identifying producers, predators and prey		✓			
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			✓		
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				✓	
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					✓

Year 4 Overview Objectives	
Living in Environments	• making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • qathering, 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 • identifying differences, similarities or changes related to simple scientific ideas and processes • recognise that living things can be grouped in a variety of ways • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • recognise that environments can change and that this can sometimes pose dangers to living things
Eating and Digestion	• asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, 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, displays or presentations of results and conclusions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings • describe the simple functions of the basic parts of the digestive system in humans • identify the different types of teeth in humans and their simple functions • construct and interpret a variety of food chains, identifying producers, predators and prey

States of Matter	• asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • 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 • using straightforward scientific evidence to answer questions or to support their findings • 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

Year 4 Overview Objectives	
Changing Sound	• 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 • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • using straightforward scientific evidence to answer questions or to support their findings

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

Year 5 Objectives	Changes and Reproduction	Properties and Changes of Materials	Earth and Space	Forces in Action	Life Cycles
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	✓		✓	✓	✓
using test results to make predictions to set up further comparative and fair tests	✓				
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	✓	✓		✓	✓
identifying scientific evidence that has been used to support or refute ideas or arguments	✓				✓
describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird					✓
describe the life process of reproduction in some plants and animals					✓
describe the changes as humans develop to old age	✓				
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		✓			
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			✓		
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				✓	

Year 5 Overview Objectives	
Changes and Reproduction	• 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 • using test results to make predictions to set up further comparative and fair tests • 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 • identifying scientific evidence that has been used to support or refute ideas or arguments • describe the changes as humans develop to old age
Properties and changes of materials	• 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 degree of trust in results, in oral and written forms such as displays and other presentations • 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

Year 5 Overview Objectives	
Earth and Space	• recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • 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
Forces in Action	• 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 degree of trust in results, in oral and written forms such as displays and other presentations • 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

Life Cycles	• 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 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 • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals

Year 6 Objectives	Classifying Organisms	Healthy Bodies	Evolution and Inheritance	Seeing Light	Changing Circuits
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	✓	✓	✓		
using test results to make predictions to set up further comparative and fair tests					
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	✓	✓	✓	✓	✓
identifying scientific evidence that has been used to support or refute ideas or arguments		✓	✓		
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	✓				
give reasons for classifying plants and animals based on specific characteristics	✓				
identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood		✓			
recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function		✓			
describe the ways in which nutrients and water are transported within 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			✓		
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.				✓	
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					✓

Year 6 Overview Objectives	
Classifying Organisms	• 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 • 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 • 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 • give reasons for classifying plants and animals based on specific characteristics
Healthy Bodies	• 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 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 • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • describe the ways in which nutrients and water are transported within animals, including humans

Evolution and Inheritance	• 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 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 • 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

Year 6 Overview Objectives	
Seeing Light	• 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 degree of trust in results, in oral and written forms such as displays and other presentations • 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
Changing Circuits	• 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 degree of trust in results, in oral and written forms such as displays and other presentations • 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

St Mary's C of E Primary Academy SEND Science Provision

Cognition and Learning		Communication and Interaction	
Subject Barriers for SEND	Provision for SEND	Subject Barriers for SEND	Provision for SEND
The ability to explain a scientific concept/provide reasoning to explain thought or opinion.	Use stem sentences to provide subject specific language in a particular format- this will enable children to accurately communicate their thoughts and opinions.	Expressing themselves and sharing their thoughts and opinions orally.	Use stem sentences to provide subject specific language in a particular format-this will enable children to accurately communicate their thoughts and opinions.
The ability to recall basic information e.g the five groups of animals(mammals, fish, birds, reptiles and amphibians)	Pre-teach can be used to revisit key scientific information as well as planned retrieval questions. The use of 'do now tasks' at the beginning of lessons informed by previous learning can support retrieval.		Allow children processing time when asking direct questions. Some children need upwards of 10 seconds to process a question before they can answer. Make regular use of think, pair, share and stem sentences.
Understanding subject specific vocabulary	Pre-teach subject specific vocabulary e.g dependent/independent variables. Draw particular attention to subject specific vocabulary which could be viewed as ambiguous e.g 'results table' or 'culture'. Support understanding through definitions and visual aids.	Acquiring, comprehending and using scientific language.	Use visuals to support children in using the correct scientific name for apparatus. Widgits can support with creating visuals. Create flashcards with the common name for an object on one side and the scientific name on the other side e.g. taste buds/fungiform papillae.

Difficulty in producing accurate pieces of writing e.g an explanatory text of a scientific concept. Understanding 'abstract' scientific concepts such as electricity/air resistance.	Use writing frames, 'fill the blank' sentences, sentence starters, vocabulary mats, visuals to sequence. Use a range of ways to record learning through laptops/recordings. Where possible, begin the lesson by using concrete resources before you discuss the abstract scientific reasoning behind. For example, make a circuit with a bulb, battery and wires before you directly teach electricity. Be mindful not to conflate this with 'discovery learning' -children should have a mixture of concrete resources and direct instruction regardless of barriers to learning.		Use a reduced number of simple instructions which are supported by visuals. Appropriate modelling to aid understanding.

Sensory and Physical		Social, Emotional and Mental Health	
Subject Barriers for SEND	Provision for SEND	Subject Barriers for SEND	Provision for SEND
Fine motor skills/physical difficulties. Sensory/physical difficulties accessing specific environments during scientific experiments.	Teachers to be proactive in identifying appropriate resources/apparatus for each individual child's need. For example, when conducting an experiment, some children may require a larger a measuring tape/thermometer. Consider alternative ways to measure information e.g trundle wheel rather than measuring tape. Ensure any sensory difficulties are considered at the point of planning and appropriate alternative arrangements are made. For example if a child will find the texture of certain materials e.g cotton wool overwhelming, resources an alternative. Ensure that all environments are accessible to children with physical disabilities e.g wheelchair accessible.