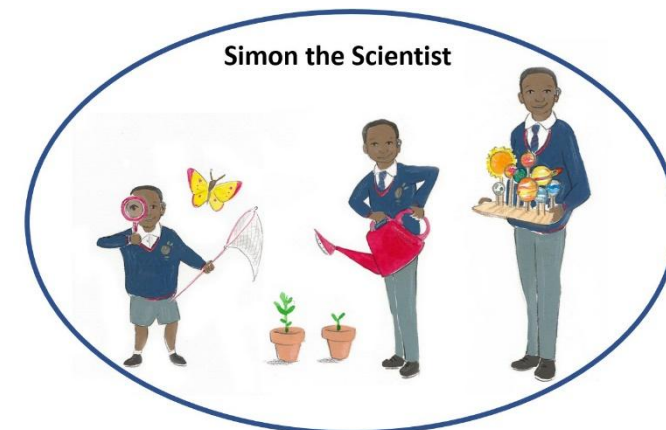




Science

Long Term Curriculum Map

Whole School Scheme of Learning



Intent: This is what we want for our children.

At Barley Fields Primary, we recognise the importance of Science in every aspect of daily life and acknowledge its importance in many careers of the future. We are proud to have designed a high quality, bespoke Science curriculum that provides children with the foundations they need to understand how things happen and why things work. We aim to instil a love of Science and aim to deliver fun and stimulating science lessons that nurture children's natural curiosity and encourage respect for living organisms and the physical environment. Enquiry is at the centre of our teaching and we acknowledge that if we are to create the scientists of the future our children need to develop scientific skills alongside knowledge acquisition and children are encouraged to make observations, plan and complete investigations as they progress through school. We offer a hands-on, enquiry-based curriculum that allows children to progressively develop the skills associated with Science as a process of enquiry including promoting questioning, challenging ideas, working practically, investigating, evaluating, making choices and using scientific vocabulary.

Through our curriculum we intend for children to develop an understanding of how important and relevant Science is in their lives, both now and in the future and utilise a range of Careers Days, Science Days and STEM activities to promote this.

By the end of their time in primary school we want our children to have a wealth of scientific knowledge and understanding. To understand what it means to work scientifically, to understand a range of concepts and be able to articulate why things happen and how things work.

Implementation: This is what it will look like in the classroom

At Barley Fields Primary our approach to teaching Science begins in Early Years with an exploration of the natural world when children explore and investigate the world around them, explore how living things grow and develop and investigate how things change and work. This prepares children for learning in KS1 and 2 when the curriculum gradually builds on common themes and scientific concepts.

Our children follow a carefully structured Science curriculum designed to ensure children know more, do more and remember more as they progress through school. Our curriculum is built around concepts within three strands of learning which are revisited as children progress through school:

- **Biology** – Animals including humans, Plants, Living things and their Habitats, Seasonal Change, Evolution and Inheritance
- **Chemistry** – Materials, Rocks, Fossils and Soil,
- **Physics** – Forces, Electricity, Magnetism, Light, sound, Earth and Space

Scientific enquiry skills are embedded into each science topic and these are enhanced, revisited and developed throughout their time in school. These follow three areas of investigational skill planning, doing, recording and explaining. Our teaching approach allows children to build upon their prior knowledge and increase their enthusiasm for Science whilst embedding prior knowledge into the long-term memory.

Science is taught in blocks of lessons to ensure children have opportunities for a sustained period of study and have time to embed and enhance their learning. The school follows a bespoke science scheme of learning designed using content from the National Curriculum and supported with the White Rose Science Scheme. This approach has been selected because it utilises content created by subject experts and is based on the latest pedagogical research however we have adapted it to suit the needs of our children.

Our scheme of learning for Science supports teaching, ensures continuity and carefully plans for progression and depth. It is underpinned by the appropriate teaching pedagogy for quality first teaching in science and ensures children's learning is practical and hands on. Specialist vocabulary linked to our Science topics is taught and built up, and effective questioning encouraged. Concepts are reinforced by focusing on the key features of scientific enquiry, so that children learn to use a variety of approaches to answer relevant scientific questions.

We are proud to offer a science curriculum that is current and research informed. As such, it is regularly adapted to meet the needs of all learners and reviewed in response to best practice. We have worked with the EEF and the National College on adaptive teaching in the classroom which underpins all our teaching practice and pedagogy.

Our curriculum characters have been designed to represent the curriculum end points as children progress through school. Our children are regularly exposed to the core skills and knowledge needed to develop as a scientist with the use of the school curriculum character – Simon the Scientist. This character is regularly used to encourage children to reflect on the key skills and concept areas of Science.

Early Years
Simon the Scientist
Natural World

- ✓ I enjoy exploring the world around me.
- ✓ I draw and write about things I have seen.
- ✓ I can talk about some important processes and changes in the natural world around me, including the seasons.



KS1
Simon the Scientist

- ✓ I enjoy working like a scientist.
- ✓ I ask questions to find out how things work or why things happen.
- ✓ I enjoy planning investigations and can make simple predictions about what might happen or change.
- ✓ I watch carefully and talk about what I have seen.
- ✓ I can draw and write about what I have seen.
- ✓ I can explain why and how things happen.



KS2
Simon the Scientist

- ✓ I enjoy working like a scientist.
- ✓ I can create questions to investigate.
- ✓ I like to plan and carry out different types of investigation fairly.
- ✓ I can gather information in different ways.
- ✓ I am good at observing and recording my results using diagrams, tables and graphs.
- ✓ I can explain why and how things happen using my scientific knowledge.



Impact: This is what it will mean for our children.

The successful approach to the teaching of science at Barley Fields results in a fun, engaging, high quality science learning journey, that provides children with the foundations for understanding the world in which they live and ensures our children have the knowledge and skills that they need once they complete their primary education.

Our science curriculum and our teaching and learning pedagogy leads to children who:

- demonstrate a love of science work and an interest in further study
- retain knowledge that is pertinent to Science with a real life context.
- be able to question ideas and reflect on knowledge.
- be able to articulate their understanding of scientific concepts and be able to reason scientifically using rich language linked to science.
- demonstrate a high love of mathematical skills through their work, organising, recording and interpreting results.
- work collaboratively and practically to investigate and experiment.

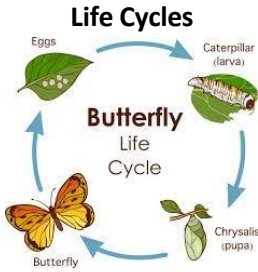
We are very proud of our children's attainment and progress in science across the primary phase. We continually observe and formatively assess children against curriculum end points using SONAR and use this information to plan their next steps in their learning and to challenge and consolidate their skills. By the end of each year, children are expected to know, apply and understand the learning specified in the science curriculum plans.

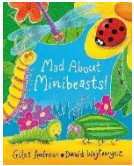
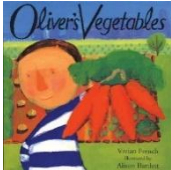
In addition, we measure the impact of our curriculum through the following methods:

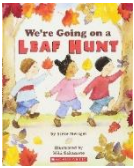
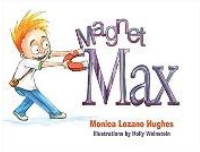
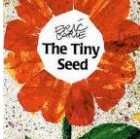
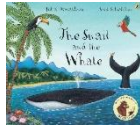
- A celebration of learning which demonstrates progression across the school (Curriculum Floor book);
- Pupil discussions about their learning (Pupil Voice);
- Internal monitoring strategies by SLT and the Science Team

Our children leave school equipped with a range of scientific knowledge and skill. They enjoy Scientific learning and activity and we are confident that it will support their learning in the future. They can apply a range of skills and knowledge to forward explanations of how and why things happen and have enjoyed discovering things for themselves.

School Overview of Science Coverage - Teaching and Learning Sequences

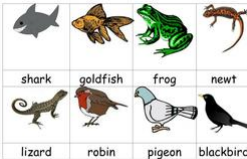
Early Years - Nursery					
Autumn		Spring		Summer	
Seasonal Changes  Exploring different textures outdoors Messy play (links to sensory mark-making)	 Seasonal Change Opportunities to experiment with ice, snow etc. Introduction to forest school and respecting the natural world	 Changing Foods Making and baking – porridge, cakes etc opportunities to observe change Link to Goldilocks and the Three Bears Seasonal Changes 	Life Cycles  Seasonal Changes 	Minibeasts  How things grow!  Planting and developing awareness of how to care for plants	 Seasonal Changes Investigating Forces  Opportunities to experiment – magnets, floating and sinking

Early Years - Reception					
Autumn		Spring		Summer	
Forest School Getting to know the site   Seasonal Changes – Autumn	Forest School What is happening to the site? Where have the animals gone? EY Garden 	Changes in states of matter freezing and melting 	Forest School Looking back – what has changed since autumn?  Living Things – Life Cycles 	Planting Maintaining the EY Garden and planting seeds	Forest School – Seasonal Changes  All Around the World (Animals in Different Habitats)

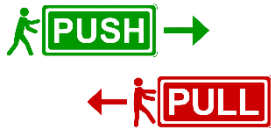
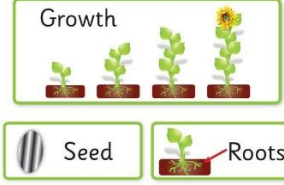
 		Magnetism  Seasonal Changes – Winter 			   
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Scientific Enquiry						
Ask Questions	Planning Investigations	Prediction	Observe and Measure	Recording Data	Analyse and Interpret Results	Explaining Results
						
Asking questions that can be answered using a scientific enquiry	Deciding on the method and equipment to use to carry out an enquiry	Using prior knowledge to suggest what will happen in a scientific enquiry	Using the senses and measuring equipment to make observations during a science enquiry	Using tables, drawings and other means to note observations and measurements	Using information from the data to say what has been found out	Explaining what they understand from scientific enquiries
Asks questions about the world around them	Begins to suggest ideas for testing (these may not be appropriate or realistic)		- With support begin to engage in first-hand and practical experiences to find things out - Use simple language to talk about their observations - Measure by direct comparison and use non standard units of measure	- Collect data collaboratively as a class – e.g. a weather station, rainfall, plant height - Make simple records of what they have seen using pictures or taking photographs		Answer how and why questions about their experiences

Year 1

Autumn		Spring		Summer	
Animals Including Humans My Body and the 5 Senses  Seasonal Change Weather Watch 	Materials Everyday Materials  Seasonal Changes Signs of Autumn 	Seasonal Change Signs of Winter  Animals Including Humans Identifying Animals 	Caring for our planet  Seasonal Change Signs of Spring 	Plants Identifying Plants 	How Plants Grow  Seasonal Change Signs of Summer 
1. What are the names of the parts of my body? 2. How do I use my body to complete tasks? 3. What is sight? 4. What is touch? 5. What is smell? 6. What is taste? 7. What is hearing? 1. What do we already know about weather? 2. What are the seasons? 3. How much water falls when it rains? 4. How are animals affected by the seasons? 5. How can we tell if the wind is blowing?	1. What is a material and how can I describe it? 2. What is it made from? 3. Which materials float and which materials sink? 4. Which materials can I melt and freeze? 5. Which materials are waterproof? 1. What is the weather like in Autumn? 2. What happens to some animals in Autumn? 3. What are the days like in Autumn?	1. How does the weather change in winter? 2. How can we measure temperature? Collect and record data 1. What animals can I identify? What do they eat? 2. What is a mammal? 3. What are birds and reptiles? 4. What are fish and amphibians? 5. How do we take care of animals? 6. Can I compare and group animals	1. Why is it important to care for our planet? 2. How do we care for the planet? 1. How does the weather change in Spring? 2. What can I see on a spring walk?	1. What is a plant? 2. What plants can we see in the garden? 3. What are wild plants? 4. What is a tree? (incl. Deciduous and Evergreen)	1. What are the parts of a plant? 2. How do plants change as they grow? 1. What changes as Spring turns into Summer? 2. What is the weather like on Summer? 3. How do I stay safe in the sun?

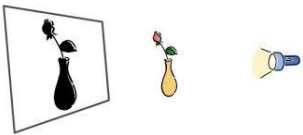
Scientific Enquiry						
Ask Questions	Planning Investigations	Prediction	Observe and Measure	Recording Data	Analyse and Interpret Results	Explaining Results
						
Asking questions that can be answered using a scientific enquiry	Deciding on the method and equipment to use to carry out an enquiry	Using prior knowledge to suggest what will happen in a scientific enquiry	Using the senses and measuring equipment to make observations during a science enquiry	Using tables, drawings and other means to note observations and measurements	Using information from the data to say what has been found out	Explaining what they understand from scientific enquiries
Begin to ask simple questions about how things work or why something happens	With support can suggest ideas for how an investigation can be planned	Begin to understand that scientific predictions are more than guesses	- With support begin to engage in first-hand and practical experiences to find things out - Talk about things they have observed - With support use simple equipment to compare and measure (non standard units)	- Collect data collaboratively as a class – e.g. a weather station, rainfall, plant height - Practically sort data with given criteria into sets –material type, animal group, leaf type - Record what they have seen or done in different ways such as drawing pictures, taking photographs and labelling diagrams - Record information onto pre-prepared Venn diagrams or tables	- Begin to talk about and answer simple questions about what they have observed - Begin to describe familiar observations with simple science vocabulary–parts of the body, materials, senses etc.	Answer and begin to ask questions about what they have observed

Year 2					
Autumn		Spring		Summer	
Forces Moving Things 	Living Things and Their Habitats Habitats and Diet 	Materials Exploring Everyday Materials 	Electricity How does it work? 	Animals Including Humans Growth and Survival 	Plants Ready, Steady, Grow 
- How does it move? - How can I make an object move? - How does it work – the play park? - Movement Investigation – with ramps	- What is the difference between living, dead and never being alive? - What is a habitat? - How does a habitat suit the animal that lives there? - What is a microhabitat and who might live there? - What is a food chain?	- Can materials be sorted into groups? - What does it mean for materials to be natural and man-made? - How can a material change shape? - Why do we use metal and plastic? - The Three Little Pigs Houses - Investigation	- What things use electricity? - How do I stay safe around electricity? - What is a battery? - What is the difference between mains and battery power? - How do we make simple electrical circuits?	- Who is my baby and how are animal babies born? - How do humans change as they grow? (Human life cycle) - What do animals and humans need to survive? - How does exercise affect my body? - What is a balanced diet? - Hygiene how clean are your hands? Investigation	- What is the difference between seeds and bulbs? - Where can we find seeds? - Planting - Investigation - What is the life cycle of a plant? - How do seeds grow best? (investigation results).

Scientific Enquiry						
Ask Questions	Planning Investigations	Prediction	Observe and Measure	Recording Data	Analyse and Interpret Results	Explaining Results
						
Asking questions that can be answered using a scientific enquiry	Deciding on the method and equipment to use to carry out an enquiry	Using prior knowledge to suggest what will happen in a scientific enquiry	Using the senses and measuring equipment to make observations	Using tables, drawings and other means to note observations and measurements	Using information from the data to say what has been found out	Explaining what they understand from scientific enquiries

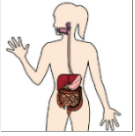
			during a science enquiry			
• Ask questions about how things work or why things happen • With support suggests own questions that can be investigated	• Plan how to find things out, with help and suggestions from adults • Begin to select the resources and objects needed for an investigation • Begin to understand things that make something fair or unfair (fair test)	• Begin to make simple predictions about what might happen	• Engage in first-hand and practical experiences to find things out • Make and describe observations of things as they happen • Begins to use simple equipment for measuring length or mass (standard units)	• Collect data collaboratively as a class/group – e.g. a weather station, rainfall, plant height • Record what they have seen by making sketches/drawings of their observations and label as appropriate • Record or present data using simple tables and prepared Venn diagrams with 2 criterion • Record or present data using simple tally charts and pictograms	• Talk about and answer simple questions using evidence from what they have observed • Describe observations with simple scientific vocabulary • Begins to notice simple patterns in results	• Ask ‘why’ and ‘what’ questions about what they observed • Begin to use some scientific vocabulary when explaining what they have found out

Year 3

Autumn		Spring		Summer	
Forces and Magnets 	Animals including Humans  Health and Movement	Rocks, Fossils and Soil 	Light Light and Shadow 	Plants How Plants Grow and Reproduce 	Scientists and Inventors  Scientists and Inventors
1. What are forces? What is friction? 2. How do objects move on different surfaces? 3. Investigating friction – How do objects move? 4. What are magnets? North and South pole. 5. Magnetic or non-magnetic? 6. Investigating materials – Are they all magnetic? 7. Magnetic Poles – What does it mean to attract and repel?	1. Identify the bones in the human skeleton. 2. What are the functions of a human skeleton? 3. Are all skeletons the same? 4. How do our muscles help us move? 5. What are the food groups of a healthy, balanced diet? 6. How do diets compare?	1. Are all rocks the same? 2. How can we classify rocks? 3. How can we investigate the properties of rocks? 4. What is soil? 5. Why is soil important? 7. Investigating soil types. 8. What are fossils and how are they formed?	1. What are the light sources? Natural/ man-made. How do we see? 2. Why is the sun important? 3. How is light reflected? 4. What is a shadow? 5. Opaque, transparent and translucent. 6. Investigation - How do shadows change?	1. What are the parts and functions of flowering plants? 2. Dissecting a plant 3. How is water transported around plants? 4. What is essential for the growth of green plants? 5. How does pollination occur? 6. How are seeds dispersed?	1. Who was Marie Curie and what is she known for? 2. Who was Mary Anning and what is she known for? 3. What is an electromagnet and why are they important?

Scientific Enquiry						
Ask Questions	Planning Investigations	Prediction	Observe and Measure	Recording Data	Analyse and Interpret Results	Explaining Results
						
Asking questions that can be answered using a scientific enquiry	Deciding on the method and equipment to use to carry out an enquiry	Using prior knowledge to suggest what will happen in a scientific enquiry	Using the senses and measuring equipment to make observations during a science enquiry	Using tables, drawings and other means to note observations and measurements	Using information from the data to say what has been found out	Explaining what they understand from scientific enquiries

- Asks a range of questions linked to a Science Topic - Identify a question to investigate from a scenario or choose from a selection provided	- Begin to suggest own ideas and approaches to answer questions - Begin to select simple and suitable equipment to use in an investigation from a selection - Begin to choose what to observe during an investigation - Begin to choose what to measure during an investigation - Begin to identify simple features that will make a fair test	Begin to make predictions that are based on previous scientific knowledge	- Observe and describe carefully what is seen - Begin to use equipment to take measurements with standard units (length, time, volume)	- Begin to recognise the importance of collecting data when investigating in science - With support record and label sketches and diagrams, sometimes with notes using simple scientific language and vocabulary - With support record observations or measurements using prepared tables - Record observations using Venn diagrams with up to 3 criterion - With support record or present data using bar charts and pictograms	- Begin to report on observations from simple investigations - orally and written - Begin to describe and identify patterns in data using prepared data (bar charts and tables)	- Use prior knowledge when explaining what they have found out from an investigation - Explain what they found out from an investigation in simple terms - Begin to suggest ways to improve an investigation or identify things that went wrong - With support begin to compare what happened to what was expected
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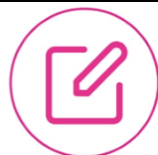
Year 4					
Autumn		Spring		Summer	
Sound Making and Changing Sound 	Electricity Circuits and Conductors 	Animals including Humans Eating and Digestion 	Living things and their Habitats Living in Environments 	Materials States of Matter 	Scientists and Inventors 
- How are sounds made? - How do we hear sounds? - Can sound travel through materials? - Can sound travel across distances? - Which materials are the best at insulating sound? - What are pitch and volume?	- Electrical Safety. - Can we build, create and draw circuits? - What's gone wrong? - What are conductors and insulators? - Investigation – How can we make a switch? - Investigation – How can we make a bulb shine brighter?	- What are human teeth like? - How do we keep our teeth healthy? - Investigation – Tooth decay - What is the digestive system? - Investigation – Making poo. - What is a food chain? - Interpret and draw food chains.	- What is a habitat? - How can we group living things? - How can we classify animals into groups? - How do we use a classification key to classify animals? - How do we use a classification key for plants? - What impact do Humans have on habitats?	- What are solids, liquids and gases? - What is a gas? - How does heat and cold change materials? - At what temperature do materials change? - What is evaporation? - What is condensation? - What is the water cycle?	- Who was Thomas Edison and what was he known for? - Who was Alexander Graham Bell and what was he known for? - Can I invent and investigate toothpaste?

Scientific Enquiry						
Ask Questions	Planning Investigations	Prediction	Observe and Measure	Recording Data	Analyse and Interpret Results	Explaining Results
						
Asking questions that can be answered using a scientific enquiry	Deciding on the method and equipment to use to carry out an enquiry	Using prior knowledge to suggest what will happen in a scientific enquiry	Using the senses and measuring equipment to make observations during a science enquiry	Using tables, drawings and other means to note observations and measurements	Using information from the data to say what has been found out	Explaining what they understand from scientific enquiries
Begin to think of questions to ask	Make suggestions about how to	Make predictions based on prior scientific	Begin to make a series of careful	Recognise the importance of collecting data	Report on findings from simple	Begin to link explanations to

that are suitable for investigation • Be able to ask a range of yes /no questions to aid sorting and classifying	collect data to answer a question • Select simple and suitable equipment for use in an investigation • Begin to suggest different ways to make observations and to collect data • Begin to plan investigations with an awareness of a fair testing	knowledge 'I think that .. will happen because...'	observations over time • Take accurate measurements with a range of equipment in standard units (length, time, volume) • Begin to understand the importance of repeating tests and observations	when investigating in science • Draw sketches and diagrams to represent what happened during investigations and label using scientific vocabulary • I can record observations or measurements using prepared tables • Record observations using tables or Venn diagrams with up to 3 criterion • Record observations and present data using bar charts and pictograms	investigations - orally and written • Describe and identify patterns in data using prepared data(bar charts, pictograms and tables)	scientific ideas and concepts • Explain what they found out from an investigation using developing scientific language and vocabulary • Begin to suggest improvements to an investigation, giving reasons for things that went wrong • With support begin to compare what happened to what was expected
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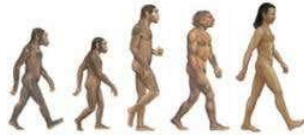
Year 5

Autumn		Spring		Summer	
Earth and Space 	Materials Properties and Changes of Materials 	Living Things and their Habitats Life Cycles 	Animals, including Humans Changes and Reproduction 	Forces Forces in Action 	Scientists and Inventors 
1. What is the Solar System? 2. What do we know about the planets? 3. How do the planets move around the sun? 4. How have ideas about the Solar system changed over time? 5. What do we know about Planet Earth? 6. Why do we have night and day? 7. What do we know about the moon?	1. What happens when we mix materials with water? 2. Can we reverse the process of dissolving materials in water? 3. Are all material changes reversible? 4. Can heating and cooling change materials? 5. What happens when something burns? 6. How can we group different materials? 7. Investigating Materials	1. What are the stages in the life cycle of a human? 2. What is the gestation period? 3. How do babies develop in their first year? 4. What happens as we get older? 5. What is the lifecycle of a mammal? Include here lessons from the RSE curriculum	1. What is the lifecycle of an amphibian? 2. What is the lifecycle of an insect? 3. What is the lifecycle of a bird? 4. How do animals reproduce? 5. How do flowering plants reproduce? What is Pollination	1. What is Gravity? 2. What is Friction 3. What is Air resistance? 4. What is water resistance? 5. How to levers and pulleys work? 6. What are gears and how do they work?	1. How can we use science to solve crimes? 2. Who is Sir David Attenborough and what is he known for? 3. Who is Tim Peak and how did he survive living in Space?

Scientific Enquiry						
Ask Questions	Planning Investigations	Prediction	Observe and Measure	Recording Data	Analyse and Interpret Results	Explaining Results
						
Asking questions that can be answered using a scientific enquiry	Deciding on the method and equipment to use to carry out an enquiry	Using prior knowledge to suggest what will happen in a scientific enquiry	Using the senses and measuring equipment to make observations	Using tables, drawings and other means to note observations and measurements	Using information from the data to say what has been found out	Explaining what they understand from scientific enquiries

			during a science enquiry			
• Begin to ask a range of scientific questions to answer through investigation • Respond to scientific questions with suggestions for how they could be investigated	• Begin to plan different types of scientific enquiries to answer questions • With support use previous science experiences to suggest equipment needed to conduct an investigation • Choose what observations to make and what data to gather during an investigation • Begin to plan a fair test and understand why it is important • With support begin to recognise and control simple variables	• Make predictions based on prior scientific knowledge 'I think that .. will happen because...'	• Begin to make a series of systematic and careful observations over time • Take accurate measurements using a range of equipment such as rulers, scales, timers and thermometers • Begin to repeat tests and observations and begin to explain differences that may occur	• Record observations using simple scientific diagrams • With support make and record observations over a period of time • Record observations using simple classification keys and Venn diagrams • With support record observations using bar charts and simple line graphs.	• Report on findings from investigations, including oral and written explanations • Describe, compare and identify data patterns using prepared data (bar charts, tables and line graphs) • Begin to compare observations made over a period of time	• Explain what they found out by referring to scientific ideas and concepts • Use scientific language and vocabulary when explaining what they found out • Begin to suggest improvements to investigations to improve reliability • Begin to compare what happened to what was expected

Year 6

Autumn		Spring		Summer	
Animals including Humans The Circulatory System 	Electricity Changing Circuits 	Living Things and Their Habitats Classifying Organisms 	Evolution and Inheritance 	Light and Sound Seeing Light 	Scientists and Inventors 
1. What is the circulatory system – heart, lungs and blood vessels 2. What is blood? Investigation 3. How does blood move through the heart? 4. Heart Dissection Science Investigation 5. Science Investigation – Is there a link between heartbeat and exercise? 6. How does diet, drugs and cigarettes affect the human body?	1. How can we construct series circuits in different ways? 2. How can we construct and draw series circuits using symbols? 3. What are complete and incomplete circuits? 4. How can we change circuits to make different things happen? 5. Science Investigation – Exploring the effects of Voltage	1. What are the conditions for life? 2. How do we group and classify organisms? 3. How do we classify animals? 4. How do we classify plants? 5. What is a micro-organism? 6. Who was Carl Linnaeus? 7. Investigation – What is Yeast?	1. What are inheritance characteristics? 2. How do animals and plants adapt? 3. What is evolution? 4. Who was Charles Darwin? 5. What is natural selection? 1. Science Investigation – Darwin's Finches	1. How does the eye allow us to see things? 2. What is light and how does it travel? 3. How are shadows formed? 4. Investigation – How can we change Shadows? 5. What is reflection? 6. Spectacular Spectrum – Are there colours in white light?	1. Pioneering Science: The Human Heart – Who was Dr Daniel Hale Williams? 2. Who was Rosalind Franklin and what did she discover?? 3. Science in Action Meet 2 doctors – What is a vaccine?

Scientific Enquiry						
Ask Questions	Planning Investigations	Prediction	Observe and Measure	Recording Data	Analyse and Interpret Results	Explaining Results
						
Asking questions that can be answered using a scientific enquiry	Deciding on the method and equipment to use to carry out an enquiry	Using prior knowledge to suggest what will happen in a scientific enquiry	Using the senses and measuring equipment to make observations during a science enquiry	Using tables, drawings and other means to note observations and measurements	Using information from the data to say what has been found out	Explaining what they understand from scientific enquiries

• Asks questions about the world around them • Ask a range of scientific questions recognising that some can be answered through investigation and others may not • Ask scientific questions and suggest ways in which they could be investigated	• Begin to plan different types of scientific enquiries following a structured investigation model • Use previous science experiences to suggest equipment needed to conduct an investigation • Independently decide which observations to make and with help choose which data to gather • Understand the importance of fair testing • With support recognise and control simple variables	• Make predictions based on prior scientific knowledge 'I think that .. will happen because...'	• Make a series of systematic and careful observations over time • Take accurate measurements using a range of equipment such as rulers, scales, timers and thermometers • Repeat tests and observations and explain/give reasons for differences that may occur	• Record observations using simple scientific diagrams and tables • Make and record observations over a period of time • Record observations using simple classification keys and Venn diagrams • Record observations using bar charts, simple line graphs and scatter graphs	• Report on findings from investigations, including oral and written explanations • Describe, compare and identify data patterns using prepared data (tables, line graphs and scatter graphs) • Compare observations made over a period of time	• Explain what they found out by referring to scientific ideas and concepts • Use scientific language and vocabulary when explaining what they found out • Suggest improvements to investigations to improve reliability • Compare what happened to what was expected
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Key Stage 1 Year 1 Science Curriculum Coverage		Signs of Autumn	Identifying Plants Signs of Winter	My Body Identifying animals	Signs of Spring	Everyday Materials	How plants grow? Signs of Summer
Science	- 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						
	- observe changes across the four seasons - observe and describe weather associated with the seasons and how day length varies						
	- 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						

Key Stage 1 Year 2 Science Curriculum Coverage		Moving Things	Living in Habitats	Exploring Everyday materials	Electricity	Growth and Survival	Plant Growth
Science	- 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 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						
	- 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						
	- 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						

Lower Key Stage 2 Year 3 Science Curriculum Coverage		How plants grow and reproduce	Health and Movement	Forces and magnets	Rocks, Fossils and Soil	Light and Shadow	Scientists And Inventors
Science	- 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						
	- compare how things move on different surfaces - notice that some forces need contact between 2 objects, but magnetic forces can act at a distance - observe how magnets attract or repel each other and attract some materials and not others - compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials - describe magnets as having 2 poles - predict whether 2 magnets will attract or repel each other, depending on which poles are facing						
	- 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 changes						

Lower Key Stage 2 Year 4 Science Curriculum Coverage		Changing Sound	Living in Environments	Circuits and Conductors	Eating and Digestion	Materials States of Matter	Scientists and Inventors
Sc	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						

Upper Key Stage 2 Year 5 Science Curriculum Coverage		Earth and Space	Properties and Changes of Materials	Life Cycles	Changes and Reproduction	Forces in action	Scientists and Inventors
Science	• 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 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						
	- 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						

Upper Key Stage 2 Year 6 Science Curriculum Coverage		Healthy Bodies	Electricity Changing Circuits	Classifying Organisms	Evolution and Inheritance	Seeing Light	Scientists And Inventors
Science	- 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 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						
	- 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						

	- 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					