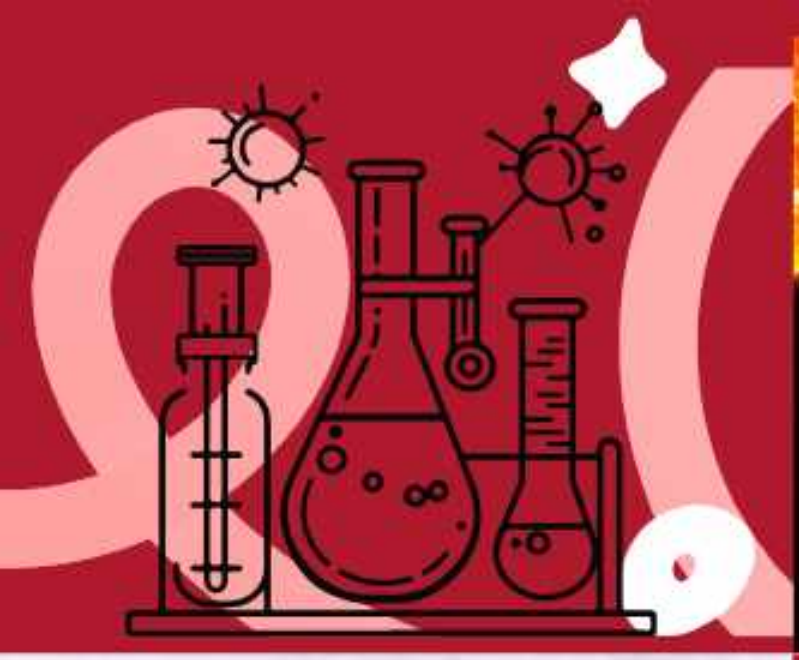






Science

Subject Lead	Mrs L. Thorneycroft

Subject Overview



As Science Lead, my vision is to inspire every child to be a curious and confident scientist.

Through an inclusive and progressive curriculum, pupils will explore, question and investigate the world around them, developing the knowledge and skills they need for the future.

Science Curriculum Aims

The National Curriculum for Sciencen aims to ensure that all pupils:

- To develop **scientific knowledge** and **conceptual understanding** through the specific disciplines of biology, chemistry and physics
- To develop understanding of the **nature, processes and methods of science** through different types of **science enquiries** that help them to **answer scientific questions** about the world around them
- Are equipped with the scientific knowledge required **to understand the uses and implications of science**, today and for the future.

EYFS and Science

Understanding of the world educational programme
(taken from the EYFS Framework 2020)

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

Early learning goals that link to science:

EYFS - Understanding the world

ELG The natural world

- 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

Curriculum Intent

Our Science Curriculum is designed to...

inspire ALL pupils to be **curious about the natural world** and **confident in thinking and working scientifically.**

We want pupils to understand that Science is not simply a collection of facts. Scientific knowledge has been developed through questions, observations, investigations, evidence, debate and refinement over time.

Pupils therefore learn both established scientific knowledge and how that knowledge has been developed.

Science provides children with opportunities to understand phenomena from their everyday lives while progressively introducing ideas that cannot always be directly seen or experienced.

We aim for pupils to...

to develop secure and increasingly connected knowledge across biology, chemistry and physics. Throughout the curriculum, they learn how scientists answer questions by observing closely, measuring accurately, classifying information, researching, identifying patterns, carrying out comparative and fair tests, collecting and analysing data, and using evidence to draw conclusions. As pupils move through the school, they progress from teacher-guided investigations towards selecting appropriate methods and designing increasingly independent scientific enquiries.

By Year 6, pupils should be able to identify a testable question, choose an appropriate enquiry type, justify equipment choices, consider variables and reliability, analyse data and evaluate the effectiveness of their methodology.

Learning is sequenced so that...

important knowledge and scientific skills are revisited with increasing depth, complexity and independence. Prior learning is explicitly activated before new scientific concepts are introduced, enabling pupils to build secure schema over time.

As they progress, pupils know more, understand a wider range of key scientific concepts, use increasingly sophisticated vocabulary, apply models to explain ideas that cannot be directly observed, make connections across different areas of science, use more complex equipment and methods, and engage with more advanced scientific and ethical questions.



We Are PURPLE!

Curriculum Implementation

Our Science curriculum is carefully sequenced, knowledge-rich and enquiry-rich. Learning is structured through three interconnected strands: **Scientific Knowledge and Understanding, which develops secure understanding across biology, chemistry and physics; Working Scientifically,** which builds pupils' understanding of the processes and methods scientists use to answer questions; and Science in Action, which explores how science shapes the past, present and future through discoveries, careers and real-world applications.

Science Learning Journey

UNIT INTRODUCTION

Each unit begins by establishing relevant prior knowledge, key scientific concepts, essential vocabulary, common misconceptions and the working-scientifically skills needed for the enquiry. Learning also makes clear links to previous and future content. Knowledge organisers help pupils identify, revisit and secure important knowledge and vocabulary throughout the unit.

Individual Lesson Sequence

Retrieval Practice

Retrieving important prior knowledge, including scientific facts, vocabulary, previously explored concepts, prior observations, enquiry skills and links to earlier units.

Hook

A scientific phenomenon, problem, observation, image, demonstration or question is introduced to spark curiosity and activate prior thinking. Pupils observe, draw on what they already know, surface misconceptions, ask questions, make initial predictions and discuss possible explanations.

Core Learning

Explicitly teach the scientific knowledge pupils need to understand the phenomenon.

This may include:

- explanation;
- modelling;
- diagrams;
- vocabulary;
- demonstrations;
- video;
- comparison;
- direct instruction;
- discussion.

Scientific vocabulary is explicitly taught so pupils can increasingly think, speak and write scientifically.

See next page for the Scientific Enquiry Cycle

Reflection

Pupils return to the original question and use scientific evidence and knowledge to:

- explain what happened;
- identify patterns;
- compare results;
- draw conclusions;
- challenge predictions;
- evaluate evidence;
- identify further questions.

Each Science unit should end with an enquiry outcome where pupils use their scientific knowledge, enquiry skills and real-world understanding to answer the unit's key question. Their response should show clear scientific reasoning, accurate vocabulary and the ability to explain and justify their ideas.

Lessons are adapted so all pupils, including those with SEND, EAL and disadvantaged backgrounds, can access and succeed.

Please see our page on Adaptive teaching for further information.

Curriculum Implementation

WORKING SCIENTIFICALLY – ENQUIRY CYCLE

Question → Plan and Predict → Observe, Test and Measure → Record → Conclude → Evaluate

Essential core for shorter enquiries: Question → Observe → Conclude

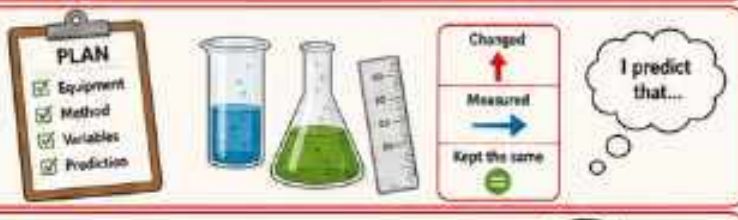
1 Question

- pose scientific questions;
- use observations or prior knowledge;
- identify which questions can be tested.



2 Plan and Predict

- choose equipment and method;
- decide what changes, what is measured, and what stays the same;
- make a prediction and explain why.



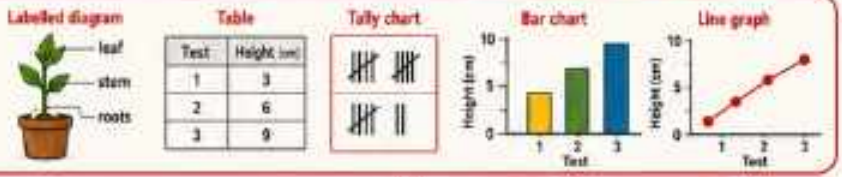
3 Observe, Test and Measure

- carry out the enquiry;
- gather qualitative and quantitative evidence;
- use accurate methods.



4 Record

- organise findings clearly;
- use diagrams, tables, tally charts or graphs.



5 Conclude

- identify patterns and relationships;
- use evidence to answer the question.



6 Evaluate

- think about accuracy, reliability and anomalies;
- suggest improvements and further questions.



Types of Scientific Enquiry



In KS1, pupils are introduced to these through Science Super Skills.

By the end of KS2, pupils select and justify the most appropriate enquiry type.

Scientific Outcome

Scientific learning is shown through pupils' knowledge and their ability to work scientifically.

practical work | observations | diagrams | tables | graphs | predictions | conclusions | evaluations | models | presentations | quizzes

Recording is purposeful and supports scientific thinking rather than replacing practical Science.

We Are PURPLE!

Curriculum Impact

We know our Science curriculum works when pupils can **remember, connect and apply scientific knowledge** and use this to explain phenomena and answer questions about the world around them. Pupils progressively become able to:

- ·ask meaningful scientific questions;
- ·choose suitable enquiry methods;
- ·use equipment accurately;
- ·collect appropriate evidence;
- ·present data clearly;
- ·identify patterns and relationships;
- ·use evidence to draw conclusions;
- ·evaluate the reliability of their findings;
- ·communicate ideas using accurate scientific vocabulary.

They understand that scientific knowledge can change as new evidence emerges and appreciate the contribution Science makes to society. By the end of primary school, pupils should be equipped with the knowledge and disciplinary skills needed to succeed at Key Stage 3 and confidently question, explore, observe and analyse the world around them.

Assessment Technique	What this means
Formative Assessment	Ongoing assessment throughout lessons. This includes opportunities such as: questioning, retrieval practice, and interactive activities. Teachers observe and assess in real-time and adapt accordingly.
Summative Assessment	End of unit quiz to assess pupils knowledge and understanding. This helps teachers understand knowledge and skills over time.
Written Outcomes	Learning is shown in different ways, including creative tasks, labelled drawings and, when needed, short pieces of written work.
Pupil Voice	Our learning sequence encourages children to talk, reflect and explain their thinking. Teachers use these moments to check understanding through questioning, discussion and simple recorded responses.

Inclusion and Adaptation

At Littleton Green, we want **every child to see themselves as a scientist.** Science provides particularly rich opportunities for pupils to succeed through practical exploration, observation, questioning and collaboration.

Teachers identify the essential scientific knowledge and enquiry skills within each lesson and remove barriers which are not central to that learning.

How We Adapt Science for All Learners

Science lessons are structured so that every child can participate.
Support may include:

- pre-teaching scientific vocabulary;
- visual vocabulary and dual coding;
- real objects and practical demonstrations;
- diagrams, photographs and models;
- carefully chunked instructions;
- teacher modelling of practical procedures;
- pre-prepared tables or recording frames;
- sentence stems for predictions and conclusions;
- reduced reading demands where reading is not the scientific objective;
- alternative methods of recording findings;
- adapted or accessible equipment;
- strategic grouping during practical investigations;
- additional rehearsal of measuring techniques;
- repeated exposure to key concepts;
- structured questions to support observation;
- targeted adult support which develops rather than replaces independence.

Challenge in Science is characterised by increasing **independence, precision and complexity.** As pupils deepen their understanding, they demonstrate more s**ophisticated questioning, make informed choices about enquiry methods, measure with greater accuracy, interpret evidence more critically, evaluate reliability and draw richer connections between scientific concepts.** Challenge should not simply mean producing more written work; it reflects the growing depth and quality of pupils' scientific thinking.

Our aim is to ensure every pupil can access and succeed in Science through thoughtful adaptation that removes barriers without lowering expectations. We adjust tasks, scaffolds, equipment and recording methods so all pupils can participate fully, think scientifically and build secure, connected understanding.

Pupil Voice



Mason. Year R

"I like science especially when we go out in nature. I am a nature detective"

Ruby. Year 2

"I love experiments and my teacher lets us think of what we need to do. If it goes wrong, then we just try again. Its DIRT"

Alfie. Year 2

"I like learning about minibeasts and now I am not frightened of them because I am a scientist"

Jenson. Year 6

"I am able to use what I know in investigations, this prepares me for High School"

Science Unit Overview



Y1

Seasonal changes
Everyday materials
Sensitive bodies
Comparing animals
Introduction to plants
Investigating science through stories

Y2

Habitats
Microhabitats
Uses of everyday materials
Life cycles and health
Plant growth
Plant-based materials

Y3

Movement and nutrition
Forces and magnets
Rocks and soils
Light and shadows
Plant reproduction
Making connections

Y4

Digestion and food
Electricity and circuits
States of matter
Sound and vibrations
Classification and changing habitats
Making connections

Y5

Mixtures and separation
Properties and changes
Earth and Space
Life cycles and reproduction
Unbalanced forces
Making connections

Y6

Classifying big and small
Light and reflection
Evolution and inheritance
Circuits, batteries and switches
Circulation and health
Are some sunglasses safer than others?

Curriculum Design

Our Science curriculum is carefully designed to develop both substantive scientific knowledge and disciplinary scientific knowledge.

Substantive Knowledge – What We Know - Substantive knowledge is the established knowledge produced by Science, including:
·facts; ·concepts; ·laws; ·theories; ·models.
Pupils develop this progressively across biology, chemistry and physics.
As their substantive knowledge develops, pupils:

- know more facts;
- encounter more examples;
- use more precise vocabulary;
- use increasingly sophisticated models;

·connect learning across different scientific domains.

Disciplinary Knowledge – How We Know - Disciplinary knowledge is developed principally through Working Scientifically.
Pupils learn:

- how scientists pose questions;
- how investigations are designed;
- how equipment is used;
- how measurement is made;
- how data is collected and represented;
- how patterns are identified;
- how evidence supports explanations;
- how methods and evidence are evaluated.

Working Scientifically is taught alongside substantive content rather than separately.



The Six Key Areas of Scientific Knowledge
The substantive curriculum develops through:

- **Plants**
- **Animals, including Humans**
- **Living Things and Their Habitats**
- **Materials**
- **Energy**
- **Forces, Earth and Space**

A seventh curriculum feature – Making Connections – allows pupils to revisit and apply knowledge and Working Scientifically skills across different contexts.

Curriculum Design

Making Connections - The Making Connections units are particularly important within the curriculum. They occur at the culmination of learning and allow pupils to:

- revisit prior knowledge;
- connect ideas across units;
- apply scientific concepts in unfamiliar contexts;
- carry out more complete investigations;
- collaborate;
- develop increasing independence;
- appreciate real-world applications of Science.

Science In Action - Science in Action ensures pupils understand that Science is a human endeavour. Pupils encounter:

- scientists from different periods of history;
- developments in scientific equipment and methods;
- changing scientific explanations;
- contemporary scientists;
- scientific careers;
- recent discoveries;
- future applications of science.

They learn that scientific understanding changes as evidence improves and that collaboration, peer review and even mistakes can contribute to scientific progress.
This provides important opportunities for cultural capital and broadens pupils' understanding of who can be a scientist.



Oracy In Science - Oracy is integral to scientific thinking. Pupils use talk to:

- think aloud;
- question;
- develop hypotheses;
- negotiate roles;
- explain observations;
- present evidence;
- challenge ideas respectfully;
- peer review;
- justify conclusions.

Curriculum Design

Cultural Capital

Science provides pupils with opportunities to understand how scientific knowledge influences their everyday lives and the wider world. Pupils encounter:

- scientists;
- scientific careers;
- healthcare;
- engineering;
- conservation;
- environmental science;
- technology;
- space exploration;
- medicine;
- scientific discoveries.

Learning should help pupils recognise that Science is not restricted to laboratories but is central to health, technology, the environment, industry and decisions societies make about the future.



PURPLE Values

Our Science curriculum reflects our PURPLE values by encouraging pupils to be:

- **Proud –** communicating discoveries confidently and valuing high-quality scientific work.
- **Unique –** asking their own questions and recognising that different ideas can contribute to scientific thinking.
- **Reflective –** evaluating evidence, methods and conclusions and learning from unexpected results.
- **Positive –** persevering when an investigation does not produce the expected outcome.
- **Loving –** appreciating and caring for the natural world and collaborating respectfully with others.
- **Empowered –** using scientific knowledge and evidence to question, investigate and make informed decisions.

British Values

Science supports British Values by helping pupils:

- **Democracy –** collaborate, discuss evidence and recognise that scientific understanding develops through challenge and debate.
- **Individual Liberty –** ask questions, express hypotheses and make reasoned choices within safe scientific practice.
- **Rule of Law –** follow agreed safety procedures and understand why rules are essential when using equipment, substances and electricity.
- **Mutual Respect –** listen to alternative explanations and collaborate effectively during investigations.
- **Tolerance and Respect for Different Beliefs and Perspectives –** recognise that scientific understanding has developed across different cultures, societies and historical periods while learning to distinguish scientific claims based upon evidence.

Progression of Knowledge and skills

Year 1		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 1 Seasonal changes Big Question Will I need an umbrella or a sun hat today?	Skills	*To know the name and order of the four seasons; spring, summer, autumn and winter.; It is unsafe to look directly at the Sun.; *To know weather associated with the four seasons and how it changes (in the UK).; day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer.	Exploring the world around them and raising their own simple questions.; Suggesting what might happen, often justifying with personal Experience.; Using their senses to describe, in simple terms, what they notice or what has changed.; Gathering specific information from one simplified, specified Source.; Using a prepared table to record results including: • Numbers. • Simple observations. • Tally frequency.; Representing data using pictograms and block graphs.; Using their results to answer simple questions.	To know about a range of jobs and careers that use scientific knowledge and methods.
	Knowledge	The name and order of the four seasons: spring, summer, autumn and winter.; That it is unsafe to look directly at the Sun.; The weather associated with the four seasons and how it changes (in the UK).; That day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer.		About a range of jobs and careers that use scientific knowledge and methods, e.g. weather reporter.

British Values	PURPLE Values	Significant Person	Key Vocabulary	Cultural Capital
Individual liberty Pupils learn to make independent choices about clothing, safety, and behaviour in different seasons	This unit supports our PURPLE vision by encouraging pupils to be proud of their learning, celebrate their unique observations, reflect on change over time, engage positively with science, show care for the world around them, and feel empowered as confident young scientists.	**Shefali Oza** - regional weather broadcaster and broadened representation on British television.	deciduous tree, evergreen tree, season , weather	**Use a weather station** - Pupils gain knowledge of how weather is measured in society, giving them background understanding valued beyond school.

Oracy opportunities	Weather reporter talk circle: Pupils work in pairs, then share in a small group or whole-class circle. One pupil takes the role of a weather reporter, the other is a listener/challenger. Pupils observe an image (or real-time weather outside) and discuss: What the weather is like What clothing is needed What might happen later in the day			
Sentence stems	**Opinion** • I think it is _____ because _____. • I agree with _____ because _____. • I disagree because _____.	**Explanation** • It is _____ and _____. • When I look outside, I see _____. • I know it is _____ because _____.	**Comparing** • It is the same as _____ because _____. • It is different because today is _____ and yesterday was _____. • They are both _____.	**Prediction** • I think it will _____ because _____. • I predict it will _____. • I think later it will _____ because _____.
End product	**Present a weather report**			

Progression of Knowledge and skills

Year 1		Scientific knowledge and understanding	Working scientifically	Science in action
	Skills	objects are items or things.; a material is what an object is made from.; To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.; property refers to how a material can be described.; To describe the physical properties of a variety of everyday materials.; materials can be grouped based on their physical properties.	Responding to suggestions on how to answer questions.; Beginning to recognise whether a planned test is fair.; With support, deciding if suggested observations are suitable.; Suggesting what might happen, often justifying with personal Experience.; Using their senses to describe, in simple terms, what they notice or what has changed.; Using a prepared table to record results including: • Numbers. • Simple observations. • Tally frequency.; Grouping based on visible Characteristics.; Using their results to answer simple questions.	
	Knowledge	Objects are items or things.; A material is what an object is made from.; A variety of everyday materials, including wood, plastic, glass, metal, water and rock.; Property refers to how a material can be described.		

Unit 2

Everyday materials

Big Question

What happens when I pull or twist it?

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Rule of Law - Apply consistent methods so tests are fair and results are trustworthy.	This supports our PURPLE vision by helping pupils feel proud of their investigations, value their unique ideas and experiences, reflect on the properties and uses of different materials, engage positively with hands-on science, show care for the world through thoughtful material choices, and feel empowered as confident learners who can question, test and explain their understanding.	Charles Macintosh - he invented waterproof fabric using rubber and naphtha	Absorbent Glass Material Object Rock Waterproof	Fabric Group Metal Plastic Tough wood	Children wear wellies for an outdoor activity (muddy playground, grass, puddles, garden area). They compare wellies with other shoes (trainers, sandals, school shoes).

Oracy opportunities	Material test talk Pupils work in small groups with a set of objects (e.g. plastic spoon, fabric, rubber band, wood, foil). Pupils test materials by pulling, twisting, bending or stretching. Each child has a role: Tester - performs the action Speaker - explains what is happening Challenger - agrees/disagrees and gives a reason			
Sentence stems	Opinion • I think this material is _____ because _____. • I like this material because _____. • I don't like this because _____.	Explanation • When I pull it, it _____. • When I twist it, it _____. • It is _____ and _____.	Comparing • They are the same because both are _____. • They are different because this one is _____ and that one is _____. • They are both _____.	Prediction • I think it will _____ when I pull it. • I predict it will _____. • I think it will change because _____.
End product	**Video showing children explaining how different materials can be manipulated**			

Progression of Knowledge and skills

Year 1		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 3 Sensitive bodies **Big Question** How do fire fighters use their senses?	Skills	To know key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth).; To know the five main senses: sight, smell, hearing, taste and touch.; eyes are used for sight, the nose is used for smell, ears are used for hearing, the tongue and mouth are used for taste and the skin is used for touch.	Recognising there are different types of enquiry (ways to answer a question).; Using their senses to describe, in simple terms, what they notice or what has changed.; Using non-standard units to measure and compare.; Drawing and labelling simple Diagrams.; Using a prepared table to record results including: • Numbers. • Simple observations. • Tally frequency.; Grouping based on visible Characteristics.; Using their results to answer simple questions.	To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern-day scientists.; To know there are spiritual, moral, social and cultural links with Science.
	Knowledge	The key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth).; The five main senses: sight, smell, hearing, taste and touch.; The skin is used for touch, the tongue is used for taste, the nose is used for smell, the eyes are used for sight and the ears are used for hearing.		A range of jobs and careers that use scientific knowledge and methods.; About the work of modern-day scientists.; There are spiritual, moral, social and cultural links with Science.

British Values	PURPLE Values	Significant Person	Key Vocabulary	Cultural Capital
Individual liberty - Express their own sensory preferences (e.g., "I don't like loud noises", "I prefer smooth textures"). Make safe, informed choices about what they touch, taste, or smell.	This unit supports our PURPLE vision by helping pupils feel proud of exploring how their bodies work, value their unique sensory experiences, reflect on how sight, hearing, smell, taste and touch help them understand the world, engage positively and curiously in practical science, show care and respect for themselves and others, and feel empowered to use scientific language to explain their observations.	Helen Keller is significant because she showed the world how people can learn and explore using their senses, especially touch, even when they cannot see or hear.	Compare, group, hearing, pattern, sense(s), sight, smell, taste, touch	Pupils take part in sensory exploration activities to understand how Helen Keller experienced the world.

Oracy opportunities	"How do firefighters use their senses?" Turn it into a role-play discussion: One child = firefighter One child = interviewer Children explain: What they can see, hear, feel or smell Why those senses are important				
Sentence stems	**Explanation** • We use our _____ to _____. • This sense helps us because _____. • A firefighter uses their _____ to _____.	**Description** • I can see _____. • I can hear _____. • I can feel _____.	**Opinion** • I think the most important sense is _____ because _____. • I agree with _____ because _____. • I disagree because _____.	**Prediction** • I think I will feel _____. • I predict it will smell _____. • I think it will sound _____ because _____.	**Comparing** • Seeing is different to hearing because _____. • They are the same because both _____. • We use both _____ and _____.
End product	Recording of children's understanding through role-playing firefighters				

Progression of Knowledge and skills

Year 1		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 4 Comparing animals	Skills	*To know the main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks, shell) *To know a variety of common animals (including fish, amphibians, reptiles, birds and mammals).; *To know that a carnivore is an animal that eats other animals and give some examples.; *To know that a herbivore is an animal that eats only plants and give some examples.; *To know that an omnivore is an animal that eats both animals and plants, and give some examples.	Recognising there are different types of enquiry (ways to answer a question).; Responding to suggestions on how to answer questions.; With support, deciding if suggested observations are Suitable.; Using their senses to describe, in simple terms, what they notice or what has changed.; Drawing and labelling simple Diagrams.; Grouping based on visible Characteristics.; Representing data using pictograms and block graphs.; Using their results to answer simple questions.	To know about famous scientists throughout history.
	Knowledge	A variety of common animals (including fish, amphibians, reptiles, birds and mammals).; The main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns, tusks and shell).; A carnivore is an animal that eats other animals and to give some examples.; A herbivore is an animal that eats only plants and to give some examples.; An omnivore is an animal that eats both animals and plants and to give some examples.		About famous scientists throughout history.

Big Question
Do chimpanzees behave like humans?

British Values	PURPLE Values	Significant Person	Key Vocabulary	Cultural Capital
Mutual Respect and Tolerance - Understand diversity in the natural world, noticing differences between species. Show care and empathy for animals and their habitats.	This unit supports our PURPLE vision by helping pupils feel proud of their learning about living things, value the unique features of different animals, reflect on similarities and differences between animals and humans, engage positively through observation and discussion, show loving care and respect for animals and their habitats, and feel empowered to use scientific vocabulary to describe and classify animals.	Jane Goodall is one of the most influential scientists of the 20th and 21st centuries. Her work permanently changed primatology, conservation, and the way humans view animals.	Amphibian carnivore Diet fish herbivore observe reptile similarity bird compare difference group mammal omnivore scientist	Share a simple, child-friendly story of Jane Goodall's life. Learning about a real scientist broadens aspirations and shows that science has purpose beyond school.

Oracy opportunities	Same or different discussion Pupils work in pairs or small groups. Provide images or videos of humans and animals (e.g. chimpanzees). Children discuss: What is the same What is different How animals behave How this is similar to humans			
Sentence stems	**Comparing** • They are the same because _____. • They are different because _____. • They both _____.	**Explanation** • I can see _____. • This animal is _____ and _____. • It has _____.	**Opinion** • I think they are similar because _____. • I agree with _____ because _____. • I disagree because _____.	**Prediction** • I think this animal will _____. • I predict it will _____ because _____. • I think it behaves like a human because _____.
End product	**Evidence of a practical sorting activity (two hoops and children sort the statements for humans or chimpanzees)**			

Progression of Knowledge and skills

Year 1		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 5 Introduction to plants Big Question Which plant parts can you eat?	Skills	To know a variety of common plants, and how they differ.; deciduous trees lose their leaves seasonally, but evergreen trees do not.; *To know the basic structure (including leaves, flowers (blossom), fruit, roots, bulb, seed, trunk, branches, stem) of a variety of common plants, including flowering plants and trees.; *To begin to understand how plants grow and change over time.	Exploring the world around them and raising their own simple questions.; Recognising there are different types of enquiry (ways to answer a question).; Responding to suggestions on how to answer questions.; With support, deciding if suggested observations are Suitable.; Ordering a simple method.; Suggesting what might happen, often justifying with personal Experience.; Using their senses to describe, in simple terms, what they notice or what has changed.; Using non-standard units to measure and compare.	To know about famous scientists throughout history.; To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern-day scientists.
	Knowledge	A variety of common plants and how they differ.; That deciduous trees lose their leaves seasonally but evergreen trees do not.; The basic structure, including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches and stem, of a variety of common plants, including flowering plants and trees.; To begin to understand how plants grow and change over time.		About famous scientists throughout history.; About the work of modern-day scientists.; There are spiritual, moral, social and cultural links with Science

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Mutual Respect and Tolerance – Respect living things by understanding how plants grow and survive. Appreciate the diversity of plant life, from tiny flowers to large trees.	This unit supports our PURPLE vision by helping pupils feel proud of growing and caring for living things, value their unique observations of plants over time, reflect on how plants grow and what they need to survive, engage positively through hands-on investigation, show loving care for the natural world, and feel empowered as young scientists who can observe, describe and explain change.	George Washington Carver Carver is a significant botanist as he explored how plants need soil, water, and sunlight.	Bulb Diagram Flower Garden plants Growth Measure Roots Stem Wild plants	Deciduous Evergreen Fruit Group Leaf Observe Seed Trunk	To grow runner beans allows children to see how each stage of the plant growth requires care and attention.

Oracy opportunities	Which part did we eat? Discussion Pupils are given real foods or images: carrot, potato, broccoli, spinach, apple, tomato In pairs or small groups, pupils sort foods by plant part: root, stem, leaf, flower, fruit Talk Task Children discuss: What the food is Which part of the plant it comes from Why they think that			
Sentence stems	**Explanation** • This is a _____. • It comes from the _____ of the plant. • I know this because _____.	**Comparing** • They are the same because _____. • They are different because _____. • They both come from the _____.	**Opinion** • I think this is a _____ because _____. • I agree with _____ because _____. • I disagree because _____.	**Prediction** • I think this plant will grow _____. • I predict it will need _____. • I think it will change because _____.
End product	**Matching activity (Match food items to plant parts e.g. Potato → stem (tuber), Broccoli → flower, Spinach → leaves)**			

Progression of Knowledge and skills

Year 1		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 6 Investigating science through stories **Big Question** Are birds carnivores, herbivores or omnivores?	Skills	*To know the name and order of the four seasons; spring, summer, autumn and winter.; it is unsafe to look directly at the Sun.; *To know weather associated with the four seasons and how it changes (in the UK).; *To know the main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks, shell) *To know a variety of common animals (including fish, amphibians, reptiles, birds and mammals).; *To know that a carnivore is an animal that eats other animals and give some examples.; *To know that a herbivore is an animal that eats only plants and give some examples.	Exploring the world around them and raising their own simple questions.; Recognising there are different types of enquiry (ways to answer a question).; Responding to suggestions on how to answer questions.; Beginning to recognise whether a planned test is fair.; With support, deciding if suggested observations are Suitable.; Suggesting what might happen, often justifying with personal Experience.; Using their senses to describe, in simple terms, what they notice or what has changed.; Beginning to use standard units and read simple scales to measure and compare.	To know about a range of jobs and careers that use scientific knowledge and methods.
	Knowledge	The basic structure, including leeves, flowers (blossom), fruit, roots, bulb, seed, trunk, branches and stem, of a variety of common plants, including flowering plants and trees.; How plants grow and change over time.; A variety of common animals (including fish, amphibians, reptiles, birds and mammals).; The main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks and shell).; The diets of carnivores, herbivores and omnivores and give examples.		To know about a range of jobs and careers that use scientific knowledge and methods.

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Mutual Respect and Tolerance - We must look after nature, including feeding birds and protecting habitats	This unit supports our PURPLE vision by helping pupils feel proud of learning about birds, value the unique foods different birds eat, reflect on how animals are grouped by what they eat, engage positively through observation, sorting and discussion, show loving care and respect for living things, and feel empowered to use simple scientific vocabulary to explain their ideas.	Bill Oddie is one of Britain's best-known ornithologists (bird specialists). He wrote simple guides and TV programmes that helped families identify birds	bird food carnivore plants seeds worms claws different sort	eat herbivore omnivore meat insects beak same group	Birdwatching provides pupils with direct experience of wildlife, building essential background knowledge of the natural world.

Oracy opportunities	Animal expert hot-seating Children explain: What the animal eats Which group it belongs to Why This supports: explaining ideas clearly organising talk using science vocabulary confidently			
Sentence stems	**Comparing** • They are the same because _____. • They are different because _____. • They both eat _____.	**Description** • This animal is a _____. • It eats _____. • It is a _____ because _____.	**Opinion** • I think this is a _____ because _____. • I agree with _____ because _____. • I disagree because _____.	**Prediction** • I think this animal will eat _____. • I predict it will eat _____ because _____. • I think it belongs in this group because _____.
End product	**Pupils write a non-chronological report about birds and their diets.**			

Progression of Knowledge and skills

Year 2		Scientific knowledge and understanding	Working scientifically	Science in action
	Skills	To know a variety of plants and animals and describe some differences.; a habitat is the environment where an animal or plant lives/grows, because it provides what they need to survive.; a micro-habitat is a very small habitat (e.g. stones, logs and leaf litter).; living things depend upon each other (e.g. for food, shelter.) *To begin to understand some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition.; *To know the difference between things that are living, dead, and things that have never been alive, using some of the life processes.	Exploring the world around them and raising their own simple questions.; Recognising there are different types of enquiry (ways to answer a question).; Gathering specific information from one simplified, specified Source.; Using a prepared table to record results including: ♦ Numbers. ♦ Simple observations. ♦ Tally frequency.; Grouping based on visible characteristics.	
	Knowledge	Some of the life processes, including movement, reproduction, sensitivity, growth, The difference between things that are living, dead, and things that have never been alive, using some of the life processes.; A variety of plants and animals and describe some differences.; A variety of habitats, including woodland, ocean, rainforest and coastal.; A habitat is the environment where an animal or plant lives/grows because it provides what Living things depend upon each other (e.g. for food, shelter).		

Unit 1
Habitats

Big Question
Who lives in a place like this?

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Mutual Respect and Tolerance - We must care for and respect the natural world	This unit supports our PURPLE vision by helping pupils feel proud of learning about where living things live, value the unique habitats and needs of different animals and plants, reflect on how environments support survival, engage positively through observation and comparison, show loving care and respect for living things and their habitats, and feel empowered to use scientific vocabulary to explain their understanding.	Steve Irwin is a significant individual because he changed the way the world understands, cares for, and protects wildlife.	habitat non-living food shelter woodland ocean pond suitable depend	living survive water space desert arctic environment adapt energy	**Dance** - Create movements inspired by animals in different habitats. Compare how animals move in water, air or land.

Oracy opportunities	Habitat detectives discussion in small groups, pupils: Match animals to their habitat Explain their reasoning Discuss what each animal needs to survive				
Sentence stems	**Description** • This animal lives in a _____ because _____. • It needs _____ to survive. • The habitat is _____ and _____.	**Comparing** • This habitat is different because _____. • They are similar because _____. • In one habitat there is _____, but in the other there is _____.	**Opinion** • I agree with _____ because _____. • I disagree because _____. • I would like to add _____.	**Questioning** • Why do you think that? • What does it eat? • How does it survive?	**Prediction** • I predict it would not survive because _____. • I think it would live there because _____. • If it moved habitats, it would _____ because _____.
End product	**Habitat matching (physical) and reasoning for their decision**				

Progression of Knowledge and skills

Year 2		Scientific knowledge and understanding	Working scientifically	Science in action
	Skills	To know a variety of plants and animals and describe some differences.; a habitat is the environment where an animal or plant lives/grows, because it provides what they need to survive.; a micro-habitat is a very small habitat (e.g. stones, logs and leaf litter).; living things depend upon each other (e.g. for food, shelter.)	Exploring the world around them and raising their own simple questions.; Recognising there are different types of enquiry (ways to answer a question).; Responding to suggestions on how to answer questions.; With support, deciding if suggested observations are Suitable.; Ordering a simple method.; Suggesting what might happen, often justifying with personal Experience.; Using their senses to describe, in simple terms, what they notice or what has changed.; Gathering specific information from one simplified, specified Source.	To know about a range of jobs and careers that use scientific knowledge and methods.
	Knowledge	A variety of plants and animals and describe some differences.; A habitat is the environment where an animal or plant lives/grows because it provides what they need to survive.; A microhabitat is a very small habitat (e.g. under stones, logs and leaf litter).; That living things depend upon each other (e.g. for food or shelter).		

Unit 2 Microhabitats **Big Question** What sort of home would be best for an earwig?	British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
	Rule of Law - understanding that some habitats are protected by law	This unit supports our PURPLE vision by helping pupils feel proud of discovering living things in their local environment, value the unique places where plants and animals live, reflect on how microhabitats provide what living things need to survive, engage positively through exploration and observation, show loving care and respect for small creatures and their habitats, and feel empowered to use scientific language to describe and explain their findings.	Maria Sibylla Merian is significant because she studied insects carefully, discovered how they grow and change, and drew beautiful pictures that helped people understand minibeasts.	microhabitat environment non-living shelter damp log under rocks depend	small living survive food dark leaf litter suitable	Have a class wormery The wormery gives pupils direct experience of living things and their habitats.

Oracy opportunities	Earwig habitat justification Groups design or build a model habitat for an earwig Discuss: where earwigs live what they need (dark, damp, shelter, food) Present their habitat to the class				
Sentence stems	**Justification** • An earwig needs _____ because _____. • This is a good habitat because _____. • It would survive here because _____.	**Discussion** • I agree with _____ because _____. • I agree and I would like to add _____. • I disagree because _____.	**Comparing** • This habitat is better because _____. • It is different because _____. • Both habitats have _____.	**Questioning** • Why do you think that? • What does it need to survive? • How does this help the earwig?	**Prediction** • I predict the earwig will live here because _____. • I think it would not survive because _____. • If the habitat changed, it would _____ because _____.
End product	**Make a bug hotel with rooms for earwigs. Write instructions to make their bug hotel.**				

Progression of Knowledge and skills

Year 2		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 3 Uses of everyday materials Big Question Why is plastic bad for the environment?	Skills	*To know why objects are made from particular materials and to give examples of their suitability.; *To know that one material can be used for a range of purposes (and to give examples.) *To know that different materials can be used for the same purpose (and to give examples.) *To know why certain materials are unsuitable for particular objects.; a push or pull must be applied to change the shape of a solid object.; *To know that solid objects can be squashed, bent, twisted or stretched.; different solid objects may take a different amount of force to change shape.	Recognising there are different types of enquiry (ways to answer a question).; Using non-standard units to measure and compare.; Using a prepared table to record results including: • Numbers. • Simple observations. • Tally frequency.; Grouping based on visible Characteristics.; Representing data using pictograms and block graphs.; Using their results to answer simple questions.	To know about a range of jobs and careers that use scientific knowledge and methods.; To know about science in the news and recent discoveries.; To know there are spiritual, moral, social and cultural links with Science.
	Knowledge	Objects are made from materials that suit their uses.; One material can be used for a range of purposes.; Different materials can be used for the same purpose.; A push or pull must be applied to change the shape of a solid object.; Solid objects can be stretched, twisted, bent or stretched.; Different solid objects may take different amounts of force to change shape.		To know A range of jobs and careers that use scientific knowledge and methods.; Science in the news and recent discoveries.; Spiritual, moral, social and cultural links with science.

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Individual liberty - children are encouraged to make independent decisions; explain their choices and express their own ideas about materials	This unit supports our PURPLE vision by helping pupils feel proud of investigating and describing materials, value the unique properties and uses of different materials, reflect on why materials are chosen for particular purposes, engage positively through hands-on exploration and testing, show loving care for the environment through responsible material choices, and feel empowered to use scientific vocabulary to explain their thinking.	Isambard Kingdom Brunel is significant because he designed strong bridges that helped people travel more easily.	plastic environment recycle repurpose litter landfill wildlife protect	pollution reuse reduce waste rubbish ocean harm materials	Go on a litter hunt and identify where most litter is found around the park Pupils develop knowledge of their local environment and how people's actions affect shared spaces.

Oracy opportunities	Eco expert debate One group argues: "Plastic is useful" One group argues: "Plastic is harmful" Pupils must: give reasons respond to others build on ideas

Sentence stems	Reasoning	Discussion	Comparing	Questioning	Prediction
	• Plastic is useful because _____. • Plastic is harmful because _____. • This material is good for the environment because _____.	• I agree with _____ because _____. • I agree and I would like to add _____. • I disagree because _____.	• This material is better because _____. • They are different because _____. • Both materials are _____.	• Why do you think that? • How does this affect the environment? • What happens after we throw it away?	• I predict this will harm the environment because _____. • I think this will last a long time because _____. • If we keep using plastic, _____ will happen.

End product	Draw a visual representation of why plastic is bad for the environment and their justification to be recorded on post-it notes and attached to their drawings

Progression of Knowledge and skills

Year 2		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 4 Life cycles and health Big Question How can I look after my body?	Skills	To understand how living things change, and that animals have offspring that grow into adults.; To know which offspring comes from which parent animal.; To know the stages in some animal life cycles.; animals, including humans, need water, food and air to survive.; To understand the importance of exercise, a balanced diet and hygiene for humans.	Recognising there are different types of enquiry (ways to answer a question).; Beginning to use standard units and read simple scales to measure and compare.; Beginning to use simple measuring equipment to make approximate measurements.; Gathering specific information from one simplified, specified Source.; Using a prepared table to record results including: • Numbers. • Simple observations. • Tally frequency.; Using their results to answer simple questions.	To know there are spiritual, moral, social and cultural links with Science
	Knowledge	Baby, toddler, child, teenager and adult are human life cycle stages.; There are differences in the life cycles of different animals.; Humans grow as they age.; The basic survival needs of animals are air, water and food.; Personal hygiene prevents the spread of germs.; Washing our hands and changing our clothes are ways to keep clean.		

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Individual liberty - having the freedom to make healthy choices	This unit supports our PURPLE vision by helping pupils feel proud of learning how to care for their bodies, value their unique needs and choices, reflect on how food, exercise and hygiene help humans stay healthy, engage positively through discussion and practical activities, show loving care and respect for themselves and others, and feel empowered to make informed choices about their wellbeing.	Louis Pasteur is significant because he discovered that germs make us ill and showed how they spread. His work helps us understand why we wash our hands and keep things clean.	body exercise diet water rest clean brush teeth strong growth germs	healthy active food sleep hygiene wash routine energy wellbeing microorganisms	**Baby role play** - Baby role play gives shared first-hand experiences, helping pupils understand: That humans have different needs at different life stages. That babies depend on adults for care.

Oracy opportunities	Healthy eating discussion Give each group picture cards showing: different foods exercise activities hygiene routines daily habits Children sort the cards into: Helps me stay healthy Does not help me stay healthy				
Sentence stems	**Explanation** • We need _____ to stay healthy because _____. • Exercise is important because _____. • Washing our hands helps because _____.	**Opinion** • I think _____ is important because _____. • In my opinion, _____ is the healthiest choice. • I agree with _____ because _____.	**Comparing** • These are similar because _____. • These are different because _____. • Both help us stay healthy because _____.	**Questioning** • Why do you think that? • Can you tell me more? • How does that help the body?	**Prediction** • I predict that if we exercise regularly, _____. • I think this habit will help because _____. • If somebody does not wash their hands, _____.
End product	**"Healthy Me Challenge" Children sort healthy/unhealthy habits. Then complete:** **"I look after my body by ___."** **"This helps because ___."**				

Progression of Knowledge and skills

Year 2		Scientific knowledge and understanding	Working scientifically	Science in action
	Skills	*To know that seeds and bulbs grow into seedlings by producing roots and shoots.; seedlings grow into mature plants by developing parts such as roots, stems, leaves and flowers.; *To know that seeds need water and warmth to germinate.; *To know that plants need water, light and a suitable temperature for growth and health.	Exploring the world around them and raising their own simple questions.; Recognising there are different types of enquiry (ways to answer a question).; Responding to suggestions on how to answer questions.; Beginning to recognise whether a planned test is fair.; With support, deciding if suggested observations are Suitable.; Suggesting what might happen, often justifying with personal Experience.; Using their senses to describe, in simple terms, what they notice or what has changed.; Beginning to use standard units and read simple scales to measure and compare.	To know there are spiritual, moral, social and cultural links with Science.
	Knowledge	Seeds and bulbs grow into seedlings by producing roots and shoots.; Seedlings grow into mature plants by developing parts such as roots, stems, leaves and flowers.; Seeds need water and warmth to germinate.; Plants need water, light and a suitable temperature for growth and health.		A range of jobs and careers that use scientific knowledge and methods.; There are spiritual, moral, social and cultural links with Science.

	British Values	PURPLE Values	Significant Person	Key Vocabulary	Cultural Capital
Unit 5 **Plant growth** **Big Question** What does a plant need to survive?	**Mutual respect and tolerance** - Understand that plants have needs, just like animals and people	This unit supports our PURPLE vision by helping pupils feel proud of growing and observing plants over time, value the unique ways seeds and bulbs develop, reflect on germination and life cycles, engage positively through hands-on investigation, show loving care for living things, and feel empowered to use scientific vocabulary to describe and explain how plants grow.	Sir Edward Salisbury is significant because he studied how plants grow in different places and what they need to survive.	plant sunlight air nutrients healthy roots leaves water light soil grow survive stem	Growing tomatoes from seed Pupils gain first-hand experience of how food is grown, supporting essential life knowledge.

Oracy opportunities	Gardener's advice Pupils act as gardening experts and explain to a younger child how to help a plant grow. They must explain; what plants need why these things are important how to care for a plant				
Sentence stems	**Giving advice** • A plant needs _____ to grow. • You should give your plant _____. • It is important to _____.	**Explaining** • Plants need _____ because _____. • This helps the plant because _____. • Without _____, the plant could _____.	**Speaking as an expert** • My advice is to _____. • I would recommend _____. • If I were a gardener, I would _____.	**Predicting** • I predict the plant will _____. • I think the plant will grow because _____. • If the plant gets enough _____, it will _____.	**Building on ideas** • I agree because _____. • I agree and I would like to add _____. • Building on your idea, _____.
End product	**Create a poster showing their learning from the unit and answering the Big Question**				

Progression of Knowledge and skills

Year 2		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 6 Plant-based materials	Skills	identify and compare natural and manufactured materials.; Describe useful properties of plant-based materials and use evidence to select a suitable material for a plant pot.; Explain why a plant-based alternative may be preferable to plastic for some uses.	Exploring the world around them and raising their own simple questions.; Recognising there are different types of enquiry (ways to answer a question).; Responding to suggestions on how to answer questions.; Beginning to recognise whether a planned test is fair.; With support, deciding if suggested observations are Suitable.; Suggesting what might happen, often justifying with personal Experience.; Using their senses to describe, in simple terms, what they notice or what has changed.; Gathering specific information from one simplified, specified Source.	To know about famous scientists throughout history.; To know about the work of modern-day scientists.
	Knowledge	Seeds and bulbs grow into seedlings by producing roots and shoots.; Seeds need water and warmth to germinate.; Plants need water, light and a suitable temperature for growth and health.; Some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition.; The difference between things that are living, dead and things that have never been alive, using some of the life processes.; Why objects are made from particular materials and to give examples of their suitability.		About famous scientists throughout history.; About the work of modern-day scientists.

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Mutual respect and tolerance - Reduce-reuse-recycle is all about respecting the environment and understanding that our actions affect other people, animals, and future generations.	This unit on plastic use supports our PURPLE vision by helping pupils feel proud of making responsible choices; value their unique ideas for reusing materials; reflect on how plastic use affects the environment; engage positively through discussion and practical activities; show loving care for the world around them; and feel empowered to act responsibly by reducing, reusing and rethinking their use of plastic.	Professor Mark Miodownik is significant because he studies materials and helps scientists find new, eco-friendly alternatives to plastic.	plastic environment reuse reduce waste landfill wildlife protect choice single-use	material pollution recycle repurpose rubbish ocean harm alternative durable	**Read Someone Swallowed Stanley** - Sarah Roberts Pupils gain awareness of environmental challenges beyond their immediate surroundings, supporting their understanding of the wider world.

Big Question
Is plastic always the answer?

Oracy opportunities	Dragon's Den Children become Eco-Inventors and present their plant pot design to the class. They must explain: what material they chose why they chose it how it helps plants how it helps the environment			
Sentence stems	**Opinion** • I believe _____. • In my opinion, _____. • I think that _____ because _____.	**Discussion** • I agree with _____ because _____. • I agree and would like to add _____. • Building on that idea, _____.	**Comparing** • They are similar because _____. • They are different because _____. • Both materials _____.	**Prediction** • I predict _____. • I think _____ will happen because _____. • I know that _____.
End product	**Make a plant pot out of a material and justify their choice**			

Progression of Knowledge and skills

Year 3		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 1 Movement and nutrition	Skills	animals can be grouped based on the presence of a skeleton.; the skeleton in humans and some animals is used for movement, protection and support.; *To know that the muscular system in humans and some animals works with the skeleton for movement.; To know the main bones in the body.; animals, including humans, need the right types and amount of nutrition.; humans cannot make their own food and therefore eat to get the nutrition needed.; *To know the main food groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) and their simple functions.	Using standard units to measure and compare.; Using measuring equipment with increasing Accuracy.; Reading scales with unmarked intervals between Numbers.; Gathering specific information from a variety of Sources.; Using a prepared table to record results including more detailed observations.; Grouping based on visible characteristics and measurable properties.; Writing a conclusion to summarise findings using simple scientific Vocabulary.; Beginning to identify new questions that would further the enquiry.	To know about famous scientists throughout history.; To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern-day scientists.; To know about science in the news and recent discoveries.
	Knowledge	Animals can be grouped based on the presence of a skeleton.; The skeleton in humans and some animals is used for movement, protection and support.; The muscular system in humans and some animals works with the skeleton for movement.; The main bones in the body.; Animals, including humans, need the right types and amount of nutrition.; Humans cannot make their own food; therefore, they eat to get the nutrition needed.		There are famous scientists throughout history.; There are a range of jobs and careers that use scientific knowledge and methods.; Scientific work is taking place with modern-day scientists.; There are science events in the news and recent discoveries.

British Values	PURPLE Values	Significant Person	Key Vocabulary	Cultural Capital
Individual liberty - Pupils learn about their own bodies and how they move, helping them understand what they can do physically.	This unit on how bodies move and how science helps through prosthetics supports our PURPLE vision by helping pupils feel proud of their learning about the human body, value the unique ways people move and are supported by technology, reflect on how science improves lives, engage positively through investigation and discussion, show loving care and respect for diversity and difference, and feel empowered to understand how science can be used to help people overcome challenges.	Hugh Herr is a scientist who designs amazing robotic legs that help people walk, run, climb, and dance again. His inventions copy how real legs move and are used all over the world.	skeleton muscles movement protect relax bend tendons posture bones joints support contract pull straighten ligaments	Read Susan Laughs by Jeanne Willis. This helps students by: Challenging assumptions Building an inclusive understanding of disability and assistive technology

Oracy opportunities		Discussion - what would happen if humans had no skeleton?		
Sentence stems	**Opinion** • In my opinion, humans would _____. • My view is that _____. • I believe humans would not be able to _____ because _____.	**Explanation** • The skeleton is important because _____. • Without a skeleton, humans would not be able to _____. • The main purpose of the skeleton is to _____.	**Comparing** • Humans with a skeleton can _____, whereas humans without a skeleton would _____. • One difference would be _____. • Both humans and animals need skeletons because _____.	**Concluding** • Our group concluded that _____. • We all agree that _____. • The strongest reason is _____.
End product	**Create a labelled model or explanation showing how the skeleton, muscles and nutrition work together to help the body move.**			

Big Question
How does my body help me move?

Progression of Knowledge and skills

Year 3		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 2 Forces and magnets **Big Question** Does the shape of a magnet affect its performance?	Skills	To know some examples of contact and non-contact forces.; some forces are a result of contact between two surfaces, but some forces can act at a distance (e.g. magnetism).; To know the North and South poles of a magnet.; To know some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other.; To know some different examples of magnets, including bar, horseshoe, button and ring. To know some uses of magnets.; *To know that friction is a contact force that acts between two surfaces to slow an object down.	Beginning to select from options which variables will be changed, measured and controlled.; Planning a simple method, verbally and in writing.; Beginning to write a simple method in numbered Steps.; Gathering specific information from a variety of Sources.; Beginning to draw more scientific diagrams by: ● Using some standard symbols. ● Drawing in 2D to produce simple line diagrams. ● Labelling with more scientific Vocabulary.; Representing data using bar charts.; Writing a conclusion to summarise findings using simple scientific Vocabulary.; Beginning to suggest how one variable may have affected another.	
	Knowledge	Examples of contact and non-contact forces.; Some forces are a result of contact between two surfaces but some forces can act at a distance (e.g. magnetism).; Magnets have a north and south pole.; Some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other.; Some different examples of magnets, including bar, horseshoe, button and ring.; Some uses of magnets.		

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Democracy - Children take turns, listen to others' viewpoints, and may help decide how to carry out investigations.	This unit supports our PURPLE vision by helping pupils feel proud of investigating physical forces, value their unique ideas and predictions, reflect on how magnets attract and repel materials, engage positively through practical enquiry and discussion, show loving care for shared resources and each other, and feel empowered to use scientific vocabulary and evidence to explain how magnets work.	William Gilbert (1544-1603) is widely regarded as the founder of the study of magnetism. He discovered that Earth behaves like a giant magnet, helping children understand why compasses work.	magnet metal repel pull south pole material steel test	magnetic attract push north pole force iron non-magnetic object	Create a song about magnets using key words such as attract. Singing together builds cultural capital by strengthening scientific vocabulary, memory and confidence in communication.

Oracy opportunities	Working in groups, pupils test different magnet shapes (e.g. bar, horseshoe, ring and disc magnets) and discuss: Which magnet appears strongest? Does shape affect performance? What evidence supports this? Were their predictions correct? After the investigation, pupils must agree on a group conclusion before presenting their findings.				
Sentence stems	**Predicting** • I predict that _____ because _____. • I think the _____ magnet will be strongest because _____. • Based on what I already know, _____.	**Describing** • I observed that _____. • The results show that _____. • We noticed that _____.	**Building on ideas** • I agree with _____ because _____. • Building on what you are saying, _____. • I have a similar idea because _____.	**Comparing** • One similarity is _____. • One difference is _____. • Both magnets _____.	**Concluding** • We concluded that _____. • Our investigation showed that _____. • The strongest evidence was _____.
End product	**Produce a data table and write a conclusion following investigating the Big Question**				

Progression of Knowledge and skills

Year 3		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 3 Rocks and soils Big Question How were fossils formed?	Skills	rocks can be grouped based on their appearance or properties, (e.g. colour, texture, hardness, permeability.) To know that rocks may contain grains, crystals or fossils.; grains and crystals appear differently and can be used to classify rocks.; soils are made from rocks and dead matter.; *To understand the relationship between the properties of rocks and their uses.; fossils can form from the remains of living things.; rocks can change over time (e.g. erosion, weathering).	Making predictions about what they think will happen by: ● Using scientific knowledge and/or personal experience to explain their prediction (because...) ● Beginning to consider cause and effect when making predictions, where appropriate. ● Predicting a trend by considering how the changing variable will affect the measured variable. (The smoother the surface, the longer the distance the car will travel) Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed.; Gathering specific information from a variety of sources.	To know about famous scientists throughout history.; To know about a range of jobs and careers that use scientific knowledge and methods.
	Knowledge	Rocks can be grouped based on appearance or properties (e.g. colour, texture, hardness and permeability).; Rocks may contain grains, crystals or fossils.; Grains and crystals appear differently and can be used to classify rocks.; Soils are made from rocks and dead matter.; The relationship between the properties of rocks and their uses.; Fossils can form from the remains of living things.		

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Individual liberty - Children build confidence in expressing explanations and curiosity about the natural world.	This unit supports our PURPLE vision by helping pupils feel proud of learning about the Earth's history, value the unique evidence fossils provide about the past, reflect on how living things change over time, engage positively through enquiry and discussion, show loving care and respect for the natural world, and feel empowered to use scientific vocabulary to explain how fossils are formed.	Mary Anning is a significant palaeontologist as her discoveries changed the scientific understanding of the time.	fossil remains skeleton shell dinosaur millions bury preserve	rock imprint bones plant extinct years sediment evidence	By creating "fossils" using bread and sweets, pupils gain experiential knowledge that helps them understand how fossils form and why they are important for learning about Earth's history and ancient life.

Oracy opportunities	Mary Anning has just discovered a new fossil on the Jurassic Coast. One pupil takes on the role of Mary Anning, while the rest of the class become: Reporters Scientists Local villagers Museum experts They interview Mary about her discovery and what it might tell us about life millions of years ago.	
Sentence stems	**Discussion** • I agree because _____. • Building on what Mary Anning said, _____. • The evidence suggests _____.	**Explaining** • I discovered _____. • I found this fossil near _____. • One interesting feature is _____.
End product	**Create 'fossils' using bread and sweets. Record children's explanations. Write a diary entry for Mary Anning following her first ichthyosaur discovery.**	

Progression of Knowledge and skills

Year 3		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 4 Light and shadows **Big Question** Does the light source's distance affect the shadow's size?	Skills	light travels from a source (e.g. the Sun, light bulbs and torches).; light is needed to see things and that dark is the absence of light.; light from the Sun can be dangerous and how to protect their eyes ; materials reflect light.; *To know that shadows are formed when the light from a light source is blocked by an opaque object.; shadows change as a result of different factors: - Changing the position of the light source. - Changing the distances between the light source, object and surface.; shadows change position and length throughout the day as the Sun changes position in the sky.	Beginning to raise further questions during the enquiry process.; Considering what makes a testable question.; Beginning to recognise that there are different types of enquiry and that they are suitable for different questions.; Beginning to make suggestions about how different questions could be answered Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed.; Using standard units to measure and compare.; Using measuring equipment with increasing Accuracy.; Reading scales with unmarked intervals between Numbers.	To know about famous scientists throughout history.; To know about a range of jobs and careers that use scientific knowledge and methods.; To know there are spiritual, moral, social and cultural links with Science.
	Knowledge	Light travels from a source (e.g. the Sun, light bulbs and torches).; Light is needed to see things and that dark is the absence of light.; Light from the Sun can be dangerous and how to protect their eyes.; All materials reflect light.; Shadows form when the light from a light source is blocked by an opaque object.; Shadows change as a result of changing the position of the light source and changing the distances between the light source, object and surface.		Famous scientists throughout history.; A range of jobs and careers use scientific knowledge and methods.; There are spiritual, moral, social and cultural links with Science.; Methods and equipment used by scientists throughout history and how these have led to modern methods.

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Democracy - Children listen to others' opinions and may help decide how to carry out the investigation.	This unit supports our PURPLE vision by helping pupils feel proud of exploring how light creates shadows, value their unique ideas and observations, reflect on how shadow size and shape change, engage positively through practical investigation and discussion, show loving care for shared equipment and each other, and feel empowered to use scientific vocabulary to explain what they discover.	Thomas Edison is significant as he invented the first practical electric light bulb—and helped introduce the modern age of electricity.	light shadow sun lamp block translucent reflect surface size	dark light source torch object transparent opaque shiny position	"Shadow Explorers" Pupils go outside to trace shadows at different times of day Compare length and direction Link changes to the Sun's movement This creates a shared experience pupils can talk about beyond the lesson.

Oracy opportunities	Pupils work in groups investigating how moving a torch closer to and further from an object affects the size of its shadow.					
Sentence stems	**Predicting** • I predict that the shadow will _____ when the light source _____. • I think the shadow will become _____ because _____. • Based on previous investigations, I think _____.	**Describing** • I observed that _____. • We noticed that _____. • The shadow became _____ when _____.	**Explaining** • Shadows are formed when _____. • Light travels from _____. • The shadow changed because _____.	**Building on others' ideas** • I agree with _____ because _____. • Building on what you are saying, _____. • I have a similar idea because _____.	**Comparing** • One similarity was _____. • One difference was _____. • When the light source was closer, _____.	**Presenting** • Today we investigated _____. • First, we predicted _____. • Then we tested _____.
End product	Record data and children write their findings					

Progression of Knowledge and skills

Year 3		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 5 Plant reproduction Big Question How is water transported in plants?	Skills	To understand the functions of the basic parts of a plant and the relationship between structure and function.; water is transported within a plant from the root, through the stem, to the leaves.; plants need water, light, air, nutrients/fertilizer and a suitable temperature for growth and health.; the needs for growth and health vary from plant to plant.; To know the life cycle of a plant from seed to mature plant.; *To know that flowers are the reproductive organ of a plant.; *To know that the process of pollination is the transfer of pollen to the female (part of the) flower.	Beginning to raise further questions during the enquiry process.; Considering what makes a testable question.; Beginning to recognise that there are different types of enquiry and that they are suitable for different questions.; Beginning to make suggestions about how different questions could be answered Beginning to suggest what observations to make and how long to make them for.; Planning a simple method, verbally and in writing.; Selecting and beginning to decide what simple equipment might be used to aid observations and Measurements.	
	Knowledge	The functions of the basic parts of a plant and the relationship between structure and function.; Water is transported within a plant from the root, through the stem and to the leaves.; Plants need water, light, air, nutrients and a suitable temperature for growth and health.; The needs for growth and health vary from plant to plant.; The life cycle of a plant from seed to mature plant.; Flowers are the reproductive organs of a plant.		

British Values	PURPLE Values	Significant Person	Key Vocabulary	Cultural Capital
Individual liberty - Pupils are encouraged to ask questions, explore how plants work, and explain ideas using their own thinking.	This unit supports our PURPLE vision by helping pupils feel proud of their scientific investigations, value their unique observations over time, reflect on how plants meet their basic needs, engage positively through hands-on enquiry, show loving care for living things, and feel empowered to use scientific vocabulary to explain how water moves through plants.	Arber was a plant morphologist — someone who studies the shape and structure of plants.	water roots leaves absorb xylem soil growth nutrients stem transport flow movement plant	"Be the Water" Pupils role-play water droplets moving from roots to leaves Use actions (absorb, travel, evaporate) Link movement to xylem and transpiration This gives pupils a shared, memorable experience they can talk about beyond the lesson.

Oracy opportunities	Pupils become botanists exploring a rainforest and discover a brand-new plant species.					
Sentence stems	**Description** • Our plant is called _____. • One feature of our plant is _____. • It reminds me of _____ because _____.	**Explaining** • Water enters the plant through the _____. • The roots absorb _____. • Water is transported through the _____.	**Reasoning** • This helps the plant survive because _____. • Our plant is suited to the rainforest because _____. • The leaves are _____ so that _____.	**Building on others' ideas** • I agree because _____. • Building on what you are saying, _____. • I have a similar idea because _____.	**Predicting** • I predict our plant will _____. • This is probable because _____. • After pollination, I predict that _____.	**Concluding** • Our group concluded that _____. • We all agree that _____. • The most important adaptation is _____.
End product	**Create a model answering the Big Question**					

Progression of Knowledge and skills

Year 3		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 6 Making connections **Big Question** Does hand span always affect grip strength?	Skills	Apply knowledge of the human body to compare variation between individuals.; Use measurements of hand span and grip strength to consider whether one variable is related to the other.	Beginning to raise further questions during the enquiry process.; Beginning to recognise that there are different types of enquiry and that they are suitable for different questions.; Beginning to select from options which variables will be changed, measured and controlled.	To know there are spiritual, moral, social and cultural links with Science.
	Knowledge	The muscular system in humans and some animals works with the skeleton for movement.; The main food groups (carbohydrates, protein, fats and oils, fibre, vitamins, minerals and water) and their simple functions.; Friction is a contact force that acts between two surfaces to slow an object down.; Rougher surfaces have more friction between them than smoother surfaces.; To understand the relationship between the properties of rocks and their uses.; shadows are formed when the light from a light source is blocked by an opaque object.		

British Values	PURPLE Values	Significant Person	Key Vocabulary	Cultural Capital
Individual liberty - Pupils are encouraged to investigate their own bodies and think independently about how physical characteristics differ.	This unit supports our PURPLE vision by helping pupils feel proud of exploring their own bodies scientifically, value the unique differences between individuals, reflect on patterns and results using evidence, engage positively through fair testing and discussion, show loving care and respect when comparing data sensitively, and feel empowered to use scientific vocabulary and measurements to explain their conclusions.	Sir Francis Galton — because he was one of the first scientists to systematically study human measurements, variation, and correlations between physical characteristics.	water roots leaves absorb xylem soil growth nutrients stem transport flow movement plant	Use the climbing wall and children reflect upon how their hands helped them.

Oracy opportunities	After collecting and analysing class data, pupils work in groups to: Identify patterns in the results. Discuss any surprising or unusual results. Reach an agreed conclusion. Present their conclusion to another group. Use their verbal conclusion to support their written conclusion.		
Sentence stems	**Description** • Our results show that _____. • The evidence suggests that _____. • One pattern we noticed was _____.	**Building on ideas** • I agree with _____ because _____. • Building on what you are saying, _____. • I have a similar idea because _____.	**Concluding** • In conclusion, _____. • Our investigation showed that _____. • The evidence suggests that _____.
End product	**Write a conclusion to answer the Big Question**		

Progression of Knowledge and skills

Year 4		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 1 Digestion and food Big Question What does poo tell us about the diet of the consumer?	Skills	*To know the main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions.; To know the different types of human teeth (incisor, canine, premolar and molar) and their simple functions.; teeth can be damaged, including the effect of sugary and acidic food.; It is important to brush teeth twice a day, make good food choices and visit the dentist regularly.; To describe the teeth of carnivores and herbivores, and understand why they are different.; predators hunt for their food and prey are the animals being hunted.	Beginning to raise further questions during the enquiry process.; Beginning to recognise that there are different types of enquiry and that they are suitable for different questions.; Beginning to select from options which variables will be changed, measured and Controlled.; Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed.; Using standard units to measure and compare.; Using measuring equipment with increasing Accuracy.; Using a prepared table to record results including more detailed observations.; Using tables with more than two columns.	To know about famous scientists throughout history.; To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern day scientists.; To know there are spiritual, moral, social and cultural links with Science.
	Knowledge	The main organs of the human digestive system are the mouth, teeth, tongue, oesophagus, stomach, small and large intestines and each has a different function.; The different types of human teeth are incisors, canines, premolars and molars and each has a different function.; Teeth can be damaged by sugary and acidic food, for example.; It is important to brush teeth twice a day, make good food choices and visit the dentist regularly.; The teeth of carnivores and herbivores are different for a reason.		Famous scientists throughout history.; There are a range of jobs and careers that use scientific knowledge and methods.; There is work taking place by modern-day scientists.; There are spiritual, moral, social and cultural links with science.

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Individual liberty - Builds confidence in independent scientific thinking and curiosity about the natural world.	This unit supports our PURPLE vision by helping pupils feel proud of learning how their bodies work, value the unique needs of different bodies, reflect on the journey food takes through the digestive system, engage positively through models and discussion, show loving care and respect for healthy choices and wellbeing, and feel empowered to use scientific vocabulary to explain how digestion helps keep us alive and healthy.	Steve Backshall is significant because he shows pupils that science is happening now and that wildlife experts use scientific knowledge every day.	diet animal carnivore plants insects hunt poo waste teeth survive	food herbivore omnivore meat bones eat droppings evidence clues	"Follow the Sandwich" Pupils role-play food moving through the digestive system Use actions and vocabulary (chew, churn, absorb) Emphasises digestion as a process, not just body parts

Oracy opportunities	Pupils become wildlife experts alongside Steve Backshall. They are given an animal dropping sample (photos, descriptions or prepared evidence cards) and must investigate: Which animal produced it? What has the animal been eating? Is it a carnivore, herbivore or omnivore? What evidence supports their conclusion?			
Sentence stems	**Discussion** • We think this animal is a carnivore because _____. • This animal is likely to be a herbivore because _____. • The remains suggest that _____.	**Building ideas** • Building on what you are saying, _____. • I understand your point of view, however _____. • I appreciate your idea, but _____.	**Comparing** • One similarity is _____. • One difference is _____. • Compared to _____, this evidence shows _____.	**Concluding** • We concluded that _____. • After examining the evidence, we think _____. • The evidence strongly suggests that _____.
End product	**Role play being Steve Backshall and film 'him' discussing what he can find in the 'poo'**			

Progression of Knowledge and skills

Year 4		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 2 Electricity and circuits **Big Question** What affects bulb brightness?	Skills	all electrical appliances need a power source, including batteries or mains electricity.; an electrical circuit needs a complete path for the electric charge to flow through.; To know the main components in a simple series circuit.; To know the precautions for working safely with electricity.; some materials allow electric charge to pass through them easily and these are known as electrical conductors (e.g. metals).; some materials do not allow electric charge to pass through them and these are known as electrical insulators (e.g wood and plastic).	Considering what makes a testable question.; Beginning to recognise that there are different types of enquiry and that they are suitable for different questions.; Beginning to make suggestions about how different questions could be answered Beginning to select from options which variables will be changed, measured and Controlled.; Planning a simple method, verbally and in Writing.; Beginning to write a simple method in numbered steps.; Selecting and beginning to decide what simple equipment might be used to aid observations and measurements.	To know about famous scientists throughout history.; To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern day scientists.
	Knowledge	All electrical appliances need a power source, including batteries or mains electricity.; An electrical circuit needs a complete path for the electrical charge to flow through.; The main components in a series circuit.; There are precautions for working safely with electricity.; Some materials allow electric charge to pass through them quickly and these are known as electrical conductors (e.g. metals).; Some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g. wood and plastic).		There are famous scientists throughout history.; There are a range of jobs and careers that use scientific knowledge and methods.; Work is done by modern-day scientists.; Methods and equipment have been used by scientists throughout history and these have led to modern methods.

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Democracy - Pupils share predictions, discuss ideas, and contribute to group decisions about how to test variables fairly (e.g. number of bulbs, batteries, wire length).	This unit supports our PURPLE vision by helping pupils feel proud of building and testing working circuits, value their unique ideas and solutions, reflect on why circuits do or do not work, engage positively through practical enquiry and problem-solving, show loving care and responsibility when using equipment safely, and feel empowered to use scientific vocabulary and reasoning to explain how electrical circuits function.	Michael Faraday is significant as Faraday didn't just think about electricity — he played with it. He built circuits, tested materials, and observed what happened.	electricity cell bulb wire current energy complete circuit brighter components	circuit battery lamp switch power connected brightness dimmer flow	**Moving in the dark** - create a dark space. Children move around trying to find objects with and without light sources.

Oracy opportunities	Role play - Pupils become a team of scientists working for Michael Faraday. Their challenge: Design an experiment to find out what affects bulb brightness.				
Sentence stems	**Predictions** • I predict that _____ because _____. • This is probable because _____. • If we add another battery, I think _____.	**Explanation** • A complete circuit needs _____. • The bulb lights because _____. • Electricity flows through _____.	**Building on ideas** • Building on what you are saying, _____. • I agree with _____ because _____. • That's a good point because _____.	**Asking questions** • How can we make the test fair? • Why did you choose that variable? • What will you measure?	**Reaching agreements** • Our group agreed that _____. • We decided to investigate _____. • The strongest reason for our choice is _____.
End product	**Carry out a fair-test investigation into bulb brightness, record results and write a conclusion answering the Big Question.**				

Progression of Knowledge and skills

Year 4		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 3 States of matter	Skills	all substances around us can exist as solids, liquids and gases To know that a property of a solid is that it keeps its shape unless a force is applied to it.; a property of a liquid can flow freely and take on the shape of a container.; a property of a gas does not have a fixed shape and can escape from an unsealed container.; heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating).; cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing).. water can exist as a solid, a liquid or a gas.	Considering what makes a testable question.; Beginning to make suggestions about how different questions could be answered Making predictions about what they think will happen by: • Using scientific knowledge and/or personal experience to explain their prediction (because...) • Beginning to consider cause and effect when making predictions, where appropriate. • Predicting a trend by considering how the changing variable will affect the measured variable. (The smoother the surface, the longer the distance the car will travel) Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed.	To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern day scientists.; To know about science in the news and recent discoveries.; To know there are spiritual, moral, social and cultural links with Science.
	Knowledge	All substances around us can exist as solids, liquids and gases.; A property of a solid is that it keeps its shape unless a force is applied to it.; A property of a liquid is that it can flow freely and take on the shape of a container.; A property of a gas is that it does not have a fixed shape and can escape from an unsealed container.; Heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating).; Cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing).		

Big Question
How does temperature affect evaporation rates?

British Values	PURPLE Values	Significant Person	Key Vocabulary	Cultural Capital
Individual liberty - Supports independence, curiosity and confidence in scientific thinking.	This unit supports our PURPLE vision by helping pupils feel proud of carrying out fair tests, value their unique predictions and ideas, reflect on how temperature affects evaporation, engage positively through practical investigation and discussion, show loving care and responsibility when working safely, and feel empowered to use scientific vocabulary and evidence to explain changes they observe.	Bernard Palissy is significant in this area of science because he was one of the first people to correctly describe the water cycle, arguing that rainwater feeds rivers — not underground oceans, as many believed at the time.	evaporation, water, temperature, energy, water vapour, state, disappear, process, liquid, heat, sun, gas, change, surface, dry	Create a story about a water droplet and their journey through the water cycle

Oracy opportunities	Pupils become a water droplet travelling through the water cycle. In pairs or groups, they create a model, storyboard or labelled diagram and then present their journey, explaining: Evaporation Condensation Precipitation Collection They must explain how temperature affects each stage and use scientific vocabulary to justify their ideas.			
Sentence stems	**Building on ideas** • Building on what you are saying, _____. • I agree because _____. • That's a good point because _____.	**Challenging ideas** • I understand your point of view, however _____. • Could there be another explanation? • What evidence supports that idea?	**Asking questions** • Why do you think evaporation happened faster? • How did temperature affect the water? • What evidence supports that conclusion?	**Concluding** • In conclusion, temperature affects evaporation because _____. • The evidence suggests that _____. • Our model shows that _____.
End product	**Carry out an evaporation investigation at different temperatures, present the results and explain how temperature affects evaporation rate.**			

Progression of Knowledge and skills

Year 4		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 4 Sound and vibrations **Big Question** Which material muffles sound the best?	Skills	*To understand that sound is a result of vibrations.; *To know that vibrations from sounds travel through mediums to the ear.; an insulating material reduces the amount of vibrations that pass through it and this can be used to protect the ears from damaging sounds.; different materials provide different amounts of insulation against sound.; To know a variety of ways to change the pitch or volume of a sound.; quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds ; stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds.	Beginning to select from options which variables will be changed, measured and Controlled.; Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed.; Gathering specific information from a variety of Sources.; Representing data using bar charts.; Drawing bars with greater accuracy.; Reading the value of bars with greater accuracy.; Recognising when results or observations do not match their predictions.	To know about a range of jobs and careers that use scientific knowledge and methods.
	Knowledge	Sound is a result of vibrations.; Vibrations from sounds travel through mediums to the ear.; An insulating material reduces the amount of vibrations that pass through it and can be used to protect the ears from damaging sounds.; Different materials provide different amounts of insulation against sound.; A variety of ways to change the pitch or volume of a sound.; Quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds.		

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Democracy - Encourages turn-taking, listening to others, and valuing group decisions.	This unit supports our PURPLE vision by helping pupils feel proud of investigating how sounds are made, value their unique observations and explanations, reflect on how vibrations change sound pitch and volume, engage positively through practical enquiry and discussion, show loving care and respect for one another by working safely and sensitively with sound, and feel empowered to use scientific vocabulary to explain how sound travels and is heard.	Alexander Graham Bell's work on the telephone depended on the principle that sound is made by vibrations.	sound noise loud pitch low medium solid ear absorb material	vibration volume quiet high travel air liquid hear muffle	Teach that not everyone experiences sound in the same way.

Oracy opportunities	Pupils become Acoustic Engineers tasked with designing a quiet space for a specific purpose: A library A recording studio A classroom A hospital waiting room Groups must decide: Which materials to use Which materials will absorb sound best How their design reduces noise Why their design is suitable for the chosen environment They then present their model to a panel of "clients" (the class).					
Sentence stems	**Explanation** • We chose _____ because _____. • This material helps to absorb sound because _____. • Sound travels through _____.	**Asking questions** • What evidence supports that choice? • Why did you select that material? • How does this design reduce sound?	**Building on ideas** • Building on what you are saying, _____. • I agree because _____. • That's a good point because _____.	**Challenging respectfully** • I understand your point of view, however _____. • I appreciate your idea, but _____. • However, I think differently because _____.	**Comparing and contrasting** • One similarity is _____. • One difference is _____. • Both materials _____.	**Reaching a conclusion** • We concluded that _____. • After testing, we found that _____. • The best material for muffling sound was _____.
End product	**Test a range of materials for sound reduction, then design and label a quiet space using evidence from the investigation.**					

Progression of Knowledge and skills

Year 4		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 5 Classification and changing habitats **Big Question** How can I classify living things?	Skills	living things can be grouped in different ways.; *To know that a classification key can be used to group and identify plants and animals.; vertebrates are animals which have a backbone and invertebrates are animals which do not have a backbone.; plants can be grouped into flowering or non-flowering varieties.; flowering plants include grasses and non-flowering plants includes ferns and mosses.; there are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish.; invertebrate groups include snails, slugs, worms, spiders and insects.	Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed.; Gathering specific information from a variety of sources.; Using a prepared table to record results including more detailed observations Using tables with more than two columns.; Grouping based on visible characteristics and measurable properties.; Populating a pre-prepared branching and number key.; Choosing appropriate questions for classification keys.	To know about famous scientists throughout history.; To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern day scientists.; To know about science in the news and recent discoveries.
	Knowledge	Living things can be grouped in different ways.; A classification key can be used to group and identify plants and animals.; Vertebrates are animals that have a backbone and invertebrates are animals that do not have a backbone.; Plants can be grouped into flowering or non-flowering varieties.; Flowering plants include grasses and non-flowering plants include ferns and mosses.; There are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish.		

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Mutual respect - Encourages respectful discussion when ideas or classifications differ.	This unit supports our PURPLE vision by helping pupils feel proud of identifying and grouping living things, value the unique characteristics and habitats of different species, reflect on how living things are suited to their environments, engage positively through observation and comparison, show loving care and respect for living things and their habitats, and feel empowered to use scientific vocabulary to classify and explain the natural world.	George Shaw is significant in this area of science because he was the first person to correctly classify the platypus from a specimen sent from Australia.	classification sort compare differences features non-living environment change survive conditions	group identify similarities characteristics living habitat microhabitat adapt suitable	Children role-play early scientists deciding how to classify the platypus.

Oracy opportunities	Pupils take on the roles of early scientists who have just been sent a specimen of a platypus from Australia. The challenge: "How should we classify this strange animal?" Groups take on roles including: Naturalist Zoologist Explorer Skeptic Using evidence, pupils discuss: Is it a mammal, bird, reptile or something else? What characteristics does it have?						
Sentence stems	**Explanation** • One characteristic of this animal is _____. • I observed that _____. • This species has _____.	**Argument** • In my opinion, _____. • I believe this animal belongs to _____ because _____. • Most people would agree that _____.	**Using evidence** • The evidence suggests that _____. • One piece of evidence is _____. • We know this because _____.	**Comparing and contrasting** • One similarity is _____. • One difference is _____. • Compared to _____, this animal _____.	**Asking questions** • What evidence supports that idea? • How do we know that? • Could this animal belong to another group?	**Building on ideas** • Building on what you are saying, _____. • I agree because _____. • That's a good point because _____.	**Challenging respectfully** • I understand your point of view, however _____. • I appreciate your idea, but _____. • However, I think differently because _____.
End product	**Create a classification key for living things and explain how environmental change can affect organisms and their habitats.**						

Progression of Knowledge and skills

Year 4		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 6 Making connections **Big Question** How does the flow of liquids compare?	Skills	Compare how different liquids flow and recognise that liquids can flow at different rates.; Use observations and measurements to describe and compare their behaviour.	Beginning to raise further questions during the enquiry process Beginning to recognise that there are different types of enquiry and that they are suitable for different questions Beginning to select from options which variables will be changed, measured and Controlled.	To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern day scientists.
	Knowledge	Liquids can flow at different rates.; A liquid that resists flowing is described as more viscous.; Comparing flow fairly requires the same volume, distance and method for each liquid.		

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Individual liberty - Builds independence and confidence in forming evidence-based conclusions.	This unit supports our PURPLE vision by helping pupils feel proud of investigating and comparing liquids, value their unique predictions and observations, reflect on how liquids behave differently, engage positively through practical enquiry and discussion, show loving care and responsibility when working safely with materials, and feel empowered to use scientific vocabulary to describe and explain what they observe.	Sir Isaac Newton discovered the scientific principles that explain why some liquids flow quickly and others flow slowly.	flow water drip run surface waterproof opaque thick fast container	liquid pour stream spread absorb transparent viscosity thin slow shape	Explore how different cultures manage water flow.

Oracy opportunities	Pupils become scientists investigating different liquids such as: Water Honey Washing-up liquid Oil Syrup					
Sentence stems	**Making predictions** • I predict that _____ will flow fastest because _____. • This is probable because _____. • Based on what I already know, _____.	**Language of explanation** • We observed that _____. • One thing we noticed was _____. • The liquid moved _____.	**Using evidence** • Our results showed that _____. • According to our measurements, _____. • One piece of evidence is _____.	**Challenging respectfully** • I understand your point of view, however _____. • I appreciate your idea, but _____. • What evidence supports that conclusion?	**Asking questions** • Why do you think that happened? • How does the evidence support your conclusion? • Which liquid flowed the fastest?	**Discussing patterns** • We noticed a pattern where _____. • Most of the results showed _____. • This result fits the pattern because _____.
End product	**Pupils to present their findings from their investigations.**					

Progression of Knowledge and skills

Year 5		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 1 Mixtures and separation **Big Question** How long will the sugar in my tea take to dissolve?	Skills	some substances will dissolve in a liquid to form a solution.; To know the factors that affect the rate of dissolving, including temperature and stirring.; *To know that some liquids and solids can be separated using sieving, filtering and evaporation and to describe these processes.	Selecting the most appropriate enquiry method to answer questions and give Justification.; Suggesting which variables will be changed, measured and controlled.; Making and explaining decisions about what observations to make and how long to make them for.; Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has Changed.; Gathering answers to open-ended questions from a variety of sources.	
	Knowledge	Some substances will dissolve in a liquid to form a solution.; The factors that affect the time taken to dissolve, including temperature and stirring.; Some liquids and solids can be separated using sieving, filtering and evaporation and to describe these processes.		

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Individual liberty - Builds confidence in scientific thinking and explaining ideas in their own words.	This unit supports our PURPLE vision by helping pupils feel proud of planning and carrying out fair tests, value their unique ideas and predictions, reflect on how dissolving, sieving and filtering are used to separate materials, engage positively through practical enquiry and problem-solving, show loving care and responsibility when working safely with equipment, and feel empowered to use scientific vocabulary and evidence to explain their conclusions.	Rosalind Franklin is a great scientist to link with filtering and sieving because she needed to separate and purify materials in order to study them.	flow water drip run surface waterproof opaque thick fast container	liquid pour stream spread absorb transparent viscosity thin slow shape	"You're the Recycling Team" Pupils are given a mixed tray (sand, paper clips, rice, stones etc). They must choose the best methods to separate each material.

Oracy opportunities	Pupils are employed as a Recycling Team and receive a mystery mixture containing: sand rice paper clips stones sugar water Their challenge is to: Decide how to separate each material. Justify the methods they choose. Explain which factors affect dissolving. Present recommendations to the class.			
Sentence stems	**Making predictions** • Based on my prior knowledge, I predict that _____. • I think the sugar will dissolve faster because _____. • The outcome will be _____.	**Argument and opinion** • An argument for this method is _____ because _____. • The two main reasons for choosing this method are _____. • Perhaps some people would argue _____.	**Using evidence** • The evidence suggests that _____. • Our investigation showed that _____. • According to our results, _____.	**Challenging respectfully** • I understand your point of view, however, _____. • That may be true, but the evidence shows _____. • Could there be another explanation?
End product	**To produce a fair test investigating the Big Question.**			

Progression of Knowledge and skills

Year 5		Scientific knowledge and understanding	Working scientifically	Science in action
	Skills	*To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets.; dissolving, mixing and changes of state are reversible changes.; some changes result in the formation of new materials and that these are usually irreversible. (e.g. burning, rusting, the action of acid on bicarbonate of soda.)	Writing a method including detail about how to ensure control variables are kept the same.; Suggesting the most appropriate equipment to make observations and measurements and justifying their Choices.; Making increasingly scientific predictions by: ● Using previous scientific knowledge and evidence to inform their predictions. ● Using scientific language to describe a potential outcome or explain why they think something will happen. ● Making links between topics to evidence a prediction.; Using standard units to measure and compare with increasing precision (decimals).; Suggesting headings to tables, including Units.	
	Knowledge	To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets.; Dissolving, mixing and changes of state are reversible changes.; Some changes result in the formation of new materials, which are usually irreversible (e.g. burning, rusting, the action of acid on bicarbonate of soda).		

Unit 2 Properties and changes Big Question What happens to a nail when it rusts?	British Values	PURPLE Values	Significant Person	Key Vocabulary			Cultural Capital
	Individual liberty - Builds confidence in drawing conclusions from evidence and understanding real-world processes.	This unit supports our PURPLE vision by helping pupils feel proud of investigating changes in materials, value their unique ideas and explanations, reflect on how some changes can be reversed while others cannot, engage positively through practical enquiry and discussion, show loving care and responsibility when working safely with materials, and feel empowered to use scientific vocabulary and evidence to explain changes they observe.	Joseph Priestly is significant as he discovered oxygen and studied burning — ideal for irreversible changes like combustion.	opaque absorbent rigid rough dull soluble impermeable durable elastic dense	transparent waterproof hard smooth magnetic insoluble conductor brittle strong light	translucent flexible soft shiny non-magnetic permeable insulator stretchy weak heavy	children act as particles in solids/liquids/gases

Oracy opportunities	Pupils become a team of materials scientists and engineers. A local bridge has started to rust and the council wants expert advice. Teams investigate: What rust is Why it forms What evidence shows a chemical change has occurred How rusting could be prevented Whether rusting can be reversed Groups then present recommendations to the council.				
Sentence stems	**Making predictions** • Based on my scientific knowledge, I predict that _____. • I think the nail will rust because _____. • Since the nail is exposed to _____, _____.	**Argument and opinion** • An argument for this idea is _____ because _____. • The two main reasons for believing this are _____. • Perhaps some people would argue that _____.	**Using evidence** • The evidence suggests that _____. • According to our results, _____. • One piece of evidence is _____.	**Challenging respectfully** • I understand your point of view; however, _____. • That may be true, but the evidence shows _____. • Could there be another explanation?	**Reaching a conclusion** • After hearing all the evidence, _____. • We concluded that _____. • The evidence strongly suggests that _____.
End product	**To summarise what happens when metal rusts.**				

Progression of Knowledge and skills

Year 5		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 3 Earth and Space **Big Question** What causes night and day?	Skills	the Sun is a star at the centre of our solar system.; *To know that the Sun, Earth and Moon are approximately spherical bodies.; To know the names, order and relative positions of the planets and other main celestial bodies.; a moon is a celestial body that orbits a planet and give examples of moons that orbit other planets.; *To know that the Earth and other planets orbit around the Sun.; the tilt of the Earth and its orbit around the Sun causes the seasons.; the Moon orbits around the Earth.	Raising questions throughout the enquiry process.; Identifying testable questions.; Selecting the most appropriate enquiry method to answer questions and give justification.; Making increasingly scientific predictions by: ● Using previous scientific knowledge and evidence to inform their predictions. ● Using scientific language to describe a potential outcome or explain why they think something will happen. ● Making links between topics to evidence a prediction.; Using standard units to measure and compare with increasing precision (decimals).; Reading a wider variety of scales with unmarked intervals between numbers.	To know about famous scientists throughout history.; To know about the work of modern day scientists.; To know about science in the news and recent Discoveries.; To know about the methods and equipment used by scientists throughout history and how these have led to modern methods.
	Knowledge	The Sun is a star at the centre of our Solar System.; The Sun, Earth and Moon are approximately spherical bodies.; The names, order and relative positions of the planets and other main celestial bodies.; A moon is a celestial body that orbits a planet and give examples of moons that orbit other planets.; The Earth and other planets orbit around the Sun.; The tilt of the Earth and its orbit around the Sun causes the seasons		Famous scientists throughout history.; How scientific knowledge has changed over time, leading to the current understanding of science.; Mistakes can lead to new discoveries.; About the work of modern-day scientists.

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Individual liberty - Pupils are encouraged to question, explore models, and develop their own understanding of scientific explanations.	This unit supports our PURPLE vision by helping pupils feel proud of exploring the wider universe, value their unique questions and ideas about Earth and space, reflect on how the Earth's rotation causes day and night, engage positively through modelling and discussion, show loving care and respect for different viewpoints and shared learning, and feel empowered to use scientific vocabulary to explain complex ideas about our world.	Nicolaus Copernicus is significant because he proposed the heliocentric model—the idea that the Sun, not the Earth, is at the centre of the solar system—triggering a major scientific revolution.	Earth Moon rotation axis night sunset shadow time zone star satellite	Sun Solar System orbit day sunrise light source hemisphere gravity planet	Compare a daytime and nighttime routine (home, school). Discuss questions like: Why do most people sleep at night?

Oracy opportunities	Pupils work as a team of scientists who have been asked to correct common misconceptions about space. Each group is given a statement such as: "The Sun moves around the Earth." "The Sun disappears at night." "The Earth stands still." "Night happens because the Moon covers the Sun." Their task is to: Decide if the statement is true or false.			
Sentence stems	**Explanation** • Day and night occur because _____. • The Earth rotates on its axis, which means _____. • As the Earth rotates, _____.	**Building on ideas** • Building on what you are saying, _____. • I would like to echo what _____ said because _____. • I see it in a similar way because _____.	**Respectful challenging** • I understand your point of view; however, _____. • That may seem true, but the evidence shows _____. • Could there be another explanation?	**Concluding** • After examining the evidence, _____. • We concluded that _____. • It is clear that _____.
End product	**To produce a factsheet explaining day and night**			

Progression of Knowledge and skills

Year 5		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 4 Life cycles and reproduction **Big Question** How are the lifecycles of an insect and an amphibian different? This unit will also include human reproduction objectives.	Skills	a life cycle shows the changes an animal or plant goes through until the reproduction of a new generation when the cycle starts again.; all living things must reproduce for the species to survive.; sexual reproduction requires two parents, whereas asexual reproduction only requires one parent.; *To know that there are different processes plants and animals use to reproduce (asexual and sexual reproduction).	Raising questions throughout the enquiry process.; Identifying testable questions.; Selecting the most appropriate enquiry method to answer questions and give Justification.; Suggesting which variables will be changed, measured and controlled.; Making and explaining decisions about what observations to make and how long to make them for.; Suggesting the most appropriate equipment to make observations and measurements and justifying their Choices.	To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern day scientists.; To know about current scientific research and what it aims to achieve in the future.
	Knowledge	A life cycle shows the changes an animal or plant goes through until the reproduction of a new generation when the cycle starts again.; All living things must reproduce for the species to survive.; Sexual reproduction requires two parents whereas asexual reproduction only requires one parent.; There are different processes plants and animals use to reproduce (asexual and sexual reproduction)		There are a range of jobs and careers that use scientific knowledge and methods.; There is current scientific research taking place with aims for achievement in the future.; Scientific evidence is used to support or refute ideas or arguments.

British Values	PURPLE Values	Significant Person	Key Vocabulary			Cultural Capital
Mutual respect - Pupils learn that different living things grow and develop in different ways, and that these differences are natural and important.	This unit supports our PURPLE vision by helping pupils feel proud of their understanding of how living things grow and change, value the unique life cycles of different animals, reflect on similarities and differences across species, engage positively through observation and discussion, show loving care and respect for living things, and feel empowered to use scientific vocabulary to explain growth, development and change.	Maria Sibylla Merian, because she was the first person to study and accurately record insect and amphibian metamorphosis through careful, scientific observation.	life cycle development reproduction fertilisation germination pupa hatchling reproduce plant ovule Puberty vocabulary: puberty development emotional changes voice breaking cycle ovaries body hair mood changes respect	reproduction offspring sexual reproduction pollination embryo metamorphosis juvenile gestation animal adolescence hormones hygiene menstruation sperm uterus sweat independence	growth adult asexual reproduction seeds larva egg maturity birth pollen growth physical changes body changes periods testes breasts personal hygiene responsibility	Read 'Tadpole's Promise' to understand how metamorphosis is a feature of insect life cycles.

Oracy opportunities	Pupils work in teams to create and present a short wildlife documentary answering: "How are the life cycles of an insect and an amphibian different?" Teams choose: an insect (e.g. butterfly, bee, dragonfly) an amphibian (e.g. frog) and compare: stages of development metamorphosis reproduction habitats similarities and differences Before creating their final comparison poster or diagram, pupils verbally explain and defend their findings.			
Sentence stems	**Comparing and contrasting** • In some ways, both organisms _____. • Another feature they have in common is _____. • Furthermore, they are both _____.	**Argument and opinion** • An argument for this comparison is _____. • My first reason is _____. • My second reason is _____.	**Building on ideas** • Building on what you are saying, _____. • I would like to echo what _____ said because _____. • I see it in a similar way because _____.	**Challenging respectfully** • I understand your point of view; however, _____. • Could there be another explanation? • Have we considered _____?
End product	**To produce two lifecycles and compare the two in relation to the Big Question.**			

Progression of Knowledge and skills

Year 5		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 5 Unbalanced forces **Big Question** What is the relationship between lever length and effort?	Skills	gravity is a non-contact force that pulls objects together.; *To know that air resistance and water resistance are both types of friction.; *To know that unsupported objects fall towards the Earth because of gravity.; friction, air resistance and water resistance act in the opposite direction to a moving object.; when forces are imbalanced, the speed, shape or direction of an object changes.; when forces are balanced the speed, shape or direction of an object stays the same.; some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.	Suggesting which variables will be changed, measured and controlled.; Making and explaining decisions about what observations to make and how long to make them for.; Writing a method including detail about how to ensure control variables are kept the same.; Writing a method that considers reliability by planning repeated readings.; Suggesting the most appropriate equipment to make observations and measurements and justifying their Choices.	
	Knowledge	Gravity is a non-contact force that pulls objects together.; Air resistance and water resistance are both types of friction.; Unsupported objects fall towards the Earth because of gravity.; Friction, air resistance and water resistance act in the opposite direction of a moving object.; When forces are unbalanced, the speed, shape or direction of an object changes.; When forces are balanced, the speed, shape or direction of an object stays the same.		About famous scientists throughout history.

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Individual liberty - Builds confidence in reasoning, problem-solving and explaining scientific ideas.	This unit supports our PURPLE vision by helping pupils feel proud of investigating forces and simple machines, value their unique ideas and predictions, reflect on how changing lever length affects effort, engage positively through practical enquiry and problem-solving, show loving care and responsibility when working safely with equipment, and feel empowered to use scientific vocabulary and evidence to explain how levers make work easier.	Archimedes is important because he discovered how levers work and showed that a small force can lift a big load.	balanced forces force pull friction water resistance contact force motion direction deceleration weight	unbalanced forces push gravity air resistance upthrust non-contact force speed acceleration mass Newtons	Pupils design their own ancient-style invention using levers, inspired by Archimedes.

Oracy opportunities	Pupils become inventors in Ancient Greece working alongside Archimedes. Their challenge: Design a machine that uses a lever to solve a real-world problem.				
Sentence stems	**Explanation** • Our invention has been designed to _____. • The purpose of our lever is to _____. • The lever helps because _____.	**Argument and opinion** • An argument for a longer lever is _____. • My first reason is _____. • My second reason is _____.	**Comparing** • In some ways, both designs _____. • Another feature they have in common is _____. • However, they differ because _____.	**Building on ideas** • Building on what you are saying, _____. • I would like to echo what _____ said because _____. • I see it in a similar way because _____.	**Challenging ideas respectfully** • I understand your point of view; however, _____. • That may be true, but the evidence shows _____. • Have we considered _____?
End product	**Produce a line graph of the investigation results and write a conclusion explaining the relationship between lever length and effort.**				

Progression of Knowledge and skills

Year 5		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 6 **Making connections** **Big Question** Does the size of an asteroid affect the diameter of its impact crater?	Skills	Apply prior learning about forces and Earth and space to model asteroid impacts.; Investigate how changing the size of a model asteroid affects the diameter of the crater produced.	Raising questions throughout the enquiry process.; Identifying testable questions.; Selecting the most appropriate enquiry method to answer questions and give justification.; Suggesting which variables will be changed, measured and controlled.; Making increasingly scientific predictions by: • Using previous scientific knowledge and evidence to inform their predictions. • Using scientific language to describe a potential outcome or explain why they think something will happen. • Making links between topics to evidence a prediction.; Using standard units to measure and compare with increasing precision (decimals).	
	Knowledge	The movement of the Earth, and other planets, relative to the Sun in the solar system.; The Sun, Earth and Moon are approximately spherical bodies.; To know the differences in the life cycles of a mammal, an amphibian, an insect and a bird.; To understand how to 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.		

British Values	PURPLE Values	Significant Person	Key Vocabulary	Cultural Capital
Individual liberty - Builds confidence in independent scientific reasoning and explaining complex ideas.	This unit supports our PURPLE vision by helping pupils feel proud of exploring space science, value their unique predictions and ideas, reflect on how the size of an impact changes craters using evidence, engage positively through modelling and investigation, show loving care and responsibility when working collaboratively with materials, and feel empowered to use scientific vocabulary and data to explain cause and effect.	Maggie Aderin-Pocock is a great scientist to link with craters because she studies the Moon and explains how rocks from space crash into its surface to make craters.	asteroid meteoroid crater collision orbit gravity planet impact crater shape meteor meteorite impact space rock belt (asteroid belt) surface Moon size	**Turn off the lights and project:** stars galaxies nebulae the James Webb Space Telescope images Play gentle space-themed music while pupils imagine what Maggie might have felt looking at the night sky.

Oracy opportunities	Pupils become scientists working for a planetary defence agency. A newly discovered asteroid is heading towards Earth and the team must advise world leaders: How dangerous is it? How might its size affect the crater it creates? What evidence supports your prediction? Can your investigation help predict the damage?				
Sentence stems	**Making predictions** • Based on my scientific knowledge, I predict that _____. • The outcome will be _____ because _____. • Since the asteroid is larger, _____.	**Explaining** • The asteroid created a larger crater because _____. • This happened as a result of _____. • The impact caused _____.	**Argument and opinion** • An argument for this conclusion is _____. • My first reason is _____. • My second reason is _____.	**Building on ideas** • Building on what you are saying, _____. • I would like to echo what _____ said because _____. • I see it in a similar way because _____.	**Challenging respectfully** • I understand your point of view; however, _____. • That may be true, but the evidence shows _____. • Could there be another explanation?
End product	**To produce a conclusion and evaluation of their practical investigation into crater size.**				

Progression of Knowledge and skills

Year 6		Scientific knowledge and understanding	Working scientifically	Science in action
	Skills	'organism' is a term used to refer to an individual living thing.; micro-organisms are organisms that are incredibly small and cannot usually be seen by the naked eye., *To know the characteristics of the different groups of vertebrate and commonly found invertebrates.	Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed.; Grouping in a broader range of contexts.; Organising the layout of number and branching keys.; Formulating appropriate questions for classification keys.	
	Knowledge	'organism' is a term used to refer to an individual living thing. o know that micro-organisms are incredibly small and cannot usually be seen by the naked eye.; To know the characteristics of the different groups of vertebrates and commonly found invertebrates.		To know about famous scientists throughout history.

British Values	PURPLE Values	Significant Person	Key Vocabulary			Cultural Capital
Tolerance of differences - Pupils learn that microorganisms can be both harmful and beneficial, challenging oversimplified or fearful assumptions.	This unit supports our PURPLE vision by helping pupils feel proud of developing secure scientific understanding, value the unique roles microorganisms play in the world, reflect on how microbes can be both helpful and harmful, engage positively through investigation and informed discussion, show loving care and responsibility for health and hygiene, and feel empowered to use scientific vocabulary and evidence to make informed decisions about wellbeing.	Carl Linnaeus is important because he created the naming and grouping system for all living things. His work helps scientists identify animals and plants and understand how they are related.	microorganism virus algae disease handwashing vaccination harmful microorganisms yeast	microbe fungi microscopic germ sterilisation immune system fermentation decay	bacteria protozoa infection hygiene antibiotic useful microorganisms mould decomposition	Food tasting Explore how different cultures use microorganisms in food: sourdough bread kimchi cheese yoghurt cocoa fermentation for chocolate This shows pupils that microbes are not just "germs"—they are essential to global cuisine and culture.

Unit 1
Classifying big and small

Big Question
Are all microorganisms harmful?

Oracy opportunities	Pupils take part in a courtroom-style debate. The microorganism has been accused of being harmful to humans. The jury must decide: "Are all microorganisms harmful?" Groups take on different roles: Defence team (useful microorganisms) Prosecution team (harmful microorganisms) Expert witnesses (scientists, doctors, food producers) Jury			
Sentence stems	**Argument and opinion** • I am convinced that _____. • Given that _____, it is clear that _____. • Based on the fact that _____, we believe _____.	**Comparing** • In some ways, microorganisms are _____. • Another benefit is _____. • However, they can also _____.	**Building on ideas** • Building on what you are saying, _____. • I would like to expand on that point by _____. • Taking that idea further, _____.	**Challenging** • I understand your point of view; however, _____. • Having considered the evidence, I disagree because _____. • Could the evidence also suggest _____?
End product	**Create an evidence-based infographic showing that microorganisms can be helpful or harmful, with examples from food production, medicine and disease.**			

Progression of Knowledge and skills

Year 6		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 2 Light and reflection **Big Question** How does light direction change?	Skills	light travels in a straight line from a light source.; *To understand that luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye.; shiny surfaces reflect light uniformly.; *To know that when light is reflected off a surface, its direction changes.; mirrors and periscopes work using reflection of light on smooth surfaces.; To understand why shadows have the same shape as the objects that cast them as a result of light travelling in straight lines.; To understand relationships between light sources, objects and shadows.	Raising questions throughout the enquiry Process.; Identifying testable questions.; Selecting the most appropriate enquiry method to answer questions and give Justification.; Suggesting which variables will be changed, measured and controlled.; Making increasingly scientific predictions by: ● Using previous scientific knowledge and evidence to inform their predictions. ● Using scientific language to describe a potential outcome or explain why they think something will happen. ● Making links between topics to evidence a prediction.; Reading a wider variety of scales with unmarked intervals between numbers.	To know about famous scientists throughout history.; To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern day scientists.
	Knowledge	Light travels in a straight line from a light source.; Luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye.; Shiny surfaces reflect light uniformly.; When light is reflected off a surface, its direction changes.; Mirrors and periscopes work using reflection of light on smooth surfaces.; Shadows have the same shape as the objects that cast them as a result of light travelling in straight lines.		There are famous scientists throughout history.; There are a range of jobs and careers that use scientific knowledge and methods.; Work is done by modern-day scientists.; There are methods and equipment used by scientists throughout history and these have led to modern methods.

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Individual liberty - Builds independence, curiosity and confidence in forming explanations based on evidence.	This unit supports our PURPLE vision by helping pupils feel proud of applying scientific knowledge to explain how light behaves, value their unique ideas and reasoning when exploring reflection and refraction, reflect on cause and effect using evidence, engage positively through practical investigation and discussion, show loving care and responsibility when working safely with equipment and respecting others' ideas, and feel empowered to use accurate scientific vocabulary and models to explain complex concepts.	Ibn al-Haytham is important because he discovered how light travels and how reflection works. He showed that we see things when light bounces off them into our eyes.	light reflection mirror smooth ray shadow translucent absorb incident ray angle of incidence periscope	light source reflect surface rough beam transparent opaque angle reflected ray angle of reflection brightness	Darken part of the classroom and create a mini camera obscura using: a cardboard box a small hole white paper Inside Pupils see an upside-down image projected inside—just as Ibn al-Haytham did.

Oracy opportunities	Pupils become scientists reviewing an investigation into reflection. Each group is given: their line graph results from the investigation ray diagrams conclusions The aim is to answer: "How does light direction change when reflected?" Groups must explain their findings and defend their interpretations while another group acts as peer reviewers.			
Sentence stems	**Explaining** • Light changed direction because _____. • Reflection occurs when _____. • The angle of incidence was _____.	**Building on ideas** • Building on what you are saying, _____. • I would like to expand on that point by _____. • Taking that idea further, _____.	**Challenging ideas** • I understand your point of view; however, _____. • Having considered the evidence, I disagree because _____. • Could the data also suggest _____?	**Concluding** • After analysing the graph, we concluded that _____. • The evidence strongly suggests that _____. • Overall, the results indicate that _____.
End product	**To create a line graph showing the findings of the investigation answering the Big Question.**			

Progression of Knowledge and skills

Year 6		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 3 Evolution and inheritance **Big Question** Why is adaptation in the animal kingdom necessary?	Skills	living things have changed over time.; fossils provide us with information about living things that inhabited the Earth millions of years ago.; *To know that characteristics are passed from parents to their offspring, but that all offspring vary from their parents.; *To know that over time, variation in offspring can affect animals' chances of survival in particular environments.; *To know that animals and plants have adapted to suit their environment over many millions of years and that this process can be called evolution.	Selecting the most appropriate enquiry method to answer questions and give justification.; Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed.; Using tables with columns that allow for repeat readings.; Calculating the mean average.; Grouping in a broader range of contexts.; Recognise the following across a broader range of contexts and in more complexity: • Naturally occurring patterns and relationships. • Making comparisons to group and classify. • Changes over time. • Relevant secondary data.	To know about famous scientists throughout history.; To know about a range of jobs and careers that use scientific knowledge and methods.; To know about the work of modern-day scientists.; To know there are spiritual, moral, social and cultural links with Science
	Knowledge	Living things have changed over time.; Fossils provide information about living things that inhabited the Earth millions of years ago.; Characteristics are passed from parents to their offspring but all offspring vary from their parents.; Over time, variation in offspring can affect animals' chances of survival in particular environments.; Animals and plants have adapted to suit their environment over many millions of years and this process can be called evolution.		Famous scientists throughout history.; A range of jobs and careers use scientific knowledge and methods.; The work of modern-day scientists.; There are spiritual, moral, social and cultural links with science.

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Tolerance of differences - Reinforces the idea that difference is necessary, natural and valuable for survival.	This unit supports our PURPLE vision by helping pupils feel proud of developing a deeper understanding of the natural world, value the unique characteristics passed on through inheritance, reflect on how living things change and adapt over time, engage positively through discussion and evidence-based enquiry, show loving care and respect for living things and biodiversity, and feel empowered to use scientific vocabulary and reasoning to explain how species evolve.	**Charles Darwin** - Darwin showed that species are not fixed. Instead, they evolve slowly as small differences build up over time.	evolution variation adaptation survival habitat characteristics genetic DNA mutation extinction reproduction	inheritance species natural selection environment offspring traits genes inherited fossil generation	Fill a box with objects representing his discoveries: replica tortoise shell different "finch beaks" (tweezers, tongs, pegs) volcanic rock a ship's logbook a compass a feather Pupils explore the objects and guess how each relates to Darwin's ideas.

Oracy opportunities	Pupils become naturalists travelling with Charles Darwin aboard HMS Beagle. Each group discovers a new species living on a fictional Galapagos island. The challenge: Can your species survive environmental change?				
Sentence stems	**Explaining** • This adaptation helps the organism survive because _____. • The characteristic increases the chance of survival by _____. • This feature is advantageous because _____.	**Using evidence** • The evidence suggests that _____. • Scientific evidence indicates that _____. • One example is _____.	**Building on ideas** • Building on what you are saying, _____. • I would like to expand on that point by _____. • Taking that idea further, _____.	**Challenging respectfully** • I understand your point of view; however, _____. • Having considered the evidence, I disagree because _____. • Could the evidence also suggest _____?	**Concluding** • After examining the evidence, we concluded that _____. • The adaptation is necessary because _____. • The evidence strongly suggests that _____.
End product	**Create an adaptation case-study poster explaining how inherited variation and natural selection can help a species survive, using evidence linked to Darwin.**				

Progression of Knowledge and skills

Year 6		Scientific knowledge and understanding	Working scientifically	Science in action
	Skills	*To know a wider variety of components in a series circuit (including buzzer and motor).; *To know the conventions used to draw circuit diagrams, including the recognised symbols for common components and using straight lines.; the voltage of a circuit can be changed and how this affects bulb brightness (or buzzer volume).	Suggesting which variables will be changed, measured and controlled.; Making and explaining decisions about what observations to make and how long to make them for.; Writing a method including detail about how to ensure control variables are kept the same.; Writing a method that considers reliability by planning repeated readings.; Suggesting the most appropriate equipment to make observations and measurements and justifying their choices.	To know about a range of jobs and careers that use scientific knowledge and methods.; To know how scientific knowledge has changed over time, leading to the current understanding of Science.
	Knowledge	A variety of components in a series circuit (including buzzer and motor).; Conventions are used to draw circuit diagrams, including the recognised symbols for common components and using straight lines.; The voltage of a circuit can be changed and this affects bulb brightness (or buzzer volume).		A range of jobs and careers that use scientific knowledge and methods.; How scientific evidence is used to support or refute ideas or arguments.

Unit 4

Circuits, batteries and switches

Big Question

Is there a link between electrical components and resistance?

British Values	PURPLE Values	Significant Person	Key Vocabulary		Cultural Capital
Individual liberty - Builds confidence in analytical thinking and using evidence to support explanations.	This unit supports our PURPLE vision by helping pupils feel proud of building and testing increasingly complex circuits, value their unique ideas and hypotheses, reflect on how resistance affects the flow of electricity, engage positively through practical investigation and problem-solving, show loving care and responsibility when working safely with electrical equipment, and feel empowered to use scientific vocabulary, diagrams and evidence to explain their understanding.	Alessandro Volta is important because he invented the first battery and showed how to create electricity. The unit of voltage — the volt — is named after him.	electricity complete circuit component battery bulb switch insulator voltage series circuit symbol energy safety	electrical circuit incomplete circuit cell wire buzzer conductor current power parallel circuit circuit diagram mains electricity	**Drama session** - You tell (or play) a short story about: Volta growing up in Italy his fascination with sparks and static electricity his rivalry with Luigi Galvani how he invented the Voltaic Pile, the world's first true battery how this invention led to everything from phones to electric cars

Oracy opportunities		Debate: "Who made the more important contribution to our understanding of electricity?"		
Sentence stems	**Using evidence** • The evidence demonstrates that _____. • Historical records show that _____. • A key piece of evidence is _____.	**Argument** • My first reason is _____. • My second reason is _____. • Another important contribution was _____.	**Building on ideas** • Building on what you are saying, _____. • I would like to expand on that point by _____. • Taking that idea further, _____.	**Challenging respectfully** • I understand your point of view; however, _____. • Having considered the evidence, I disagree because _____. • Could the evidence also suggest _____?
End product	**Build and test circuits with different components or numbers of cells, record the effect on output and explain how circuit changes affect the flow of electricity.**			

Progression of Knowledge and skills

Year 6		Scientific knowledge and understanding	Working scientifically	Science in action
	Skills	To know the main parts of the human circulatory system (heart, blood vessels and blood).; the heart pumps blood around the body.; the blood vessels transport blood around the body.; the blood transports vital substances around the body, including oxygen and nutrients.; To understand the relationships between different organ systems.; *To understand the impact of diet, exercise, drugs and lifestyle on the way a body functions.; the heart rate is the number of beats per minute.	Suggesting which variables will be changed, measured and controlled.; Making and explaining decisions about what observations to make and how long to make them for.; Writing a method including detail about how to ensure control variables are kept the same.; Writing a method that considers reliability by planning repeated readings.; Suggesting the most appropriate equipment to make observations and measurements and justifying their choices.	To know about famous scientists throughout history.; To know about a range of jobs and careers that use scientific knowledge and methods.; To know about science in the news and recent discoveries.; To know there are spiritual, moral, social and cultural links with Science.
	Knowledge	The main parts of the human circulatory system (heart, blood vessels and blood).; The heart pumps blood around the body.; Blood vessels transport blood around the body.; Blood transports vital substances around the body, including oxygen and nutrients.; The relationships between different organ systems.; The impact of diet, exercise, drugs and lifestyle on the way a body functions.		There are famous scientists throughout history.; There are a range of jobs and careers that use scientific knowledge and methods.; Science is in the news with recent discoveries.; There are spiritual, moral, social and cultural links with science.

Unit 5

Circulation and health

Big Question

Does exercise affect heart rate?

British Values	PURPLE Values	Significant Person	Key Vocabulary			Cultural Capital
Individual liberty - Builds confidence in interpreting data about themselves and making evidence-based decisions.	This unit supports our PURPLE vision by helping pupils feel proud of investigating how their bodies respond to physical activity, value the unique ways individuals' bodies work, reflect on patterns and changes using scientific evidence, engage positively through practical enquiry and discussion, show loving care and respect when comparing results sensitively, and feel empowered to make informed choices about their health and wellbeing.	Dr Christiaan Barnard is significant because he performed the world's first successful human-to-human heart transplant in 1967, a breakthrough that transformed modern medicine.	circulatory system artery blood nutrients circulation white blood cells exercise diet drugs	heart vein pulse lungs transport platelets heart rate fitness alcohol	blood vessels capillary oxygen respiration red blood cells plasma healthy lifestyle hydration smoking	Read the story 'The Heart and the Bottle' by Oliver Jeffers. It uses the heart as a metaphor for courage, curiosity, and emotional wellbeing.

Oracy opportunities	Pupils become sports scientists investigating how exercise affects the human body. Each team has collected pulse-rate data before and after different exercises. Their challenge: Does exercise affect heart rate?				
Sentence stems	**Making predictions** • Based on my scientific knowledge, I predict that _____. • Given that exercise requires more oxygen, _____. • I expect the pulse rate to _____ because _____.	**Discussion** • We noticed a trend where _____. • As the intensity of exercise increased, _____. • Most participants showed _____.	**Building on ideas** • Building on what you are saying, _____. • I would like to expand on that point by _____. • Taking that idea further, _____.	**Challenging respectfully** • I understand your point of view; however, _____. • Having considered the evidence, I disagree because _____. • Could the data also suggest _____?	**Conclusion** • After analysing the evidence, we concluded that _____. • The evidence strongly suggests that _____. • The results support the idea that _____.
End product	**Conclusion to their practical investigation linking pulse rate to exercise.**				

Progression of Knowledge and skills

Year 6		Scientific knowledge and understanding	Working scientifically	Science in action
Unit 6 Human reproduction **Big Question** Where do babies come from?	Skills	a life cycle shows the changes an animal or plant goes through until the reproduction of a new generation when the cycle starts again.; all living things must reproduce for the species to survive.; sexual reproduction requires two parents, whereas asexual reproduction only requires one parent.	Gathering answers to open-ended questions from a variety of sources.	To know about careers and scientific work linked to human reproduction and health, including midwifery, obstetrics and reproductive medicine.
	Knowledge	Sexual reproduction involves male and female reproductive cells.; Sperm fertilises an egg to form an embryo.; The embryo develops in the uterus during pregnancy.; Gestation is the period of development before birth.; Puberty prepares the reproductive system for adulthood.		Scientific and medical knowledge supports pregnancy, birth and reproductive health.; Health professionals use evidence and specialist knowledge to support parents and babies.

British Values	PURPLE Values	Significant Person	Key Vocabulary			Cultural Capital
Mutual respect - Encourages careful, respectful language and listening when discussing personal or sensitive topics.	This unit supports our PURPLE vision by engaging positively through respectful scientific discussion, show loving care and respect for themselves and others, and feel empowered to use age-appropriate scientific vocabulary to understand and explain human growth and development.	**Robert Edwards** - British physiologist whose research helped develop IVF, transforming reproductive medicine and fertility treatment.	reproduction male egg testes embryo gestation development adolescence	fertilisation female uterus penis foetus birth puberty adulthood	sexual reproduction sperm ovaries vagina pregnancy umbilical cord hormones reproduction cycle	Pupils explore how different cultures mark growing up (e.g., coming-of-age traditions, celebrations, or rites of passage).

Oracy opportunities	This short Q&A session does not lend itself to an oracy opportunity but the children will be provided with sentence stems for asking questions		
Sentence stems	**Finding our more** • Can you explain how _____? • What happens during _____? • Why is _____ important?	**Clarifying** • Can you explain that in another way? • What do you mean by _____? • Could you give an example?	**Cause and effect** • What causes _____ to happen? • What would happen if _____? • Why is _____ necessary?
End product	**Verbal explanation of how babies are made through sexual reproduction.**		