

Science Learning Journey

# Intent, Implementation and Impact

Inspired by our Christian faith, we guide children on a personalised journey towards achievement. As a learning community, we are committed to ensuring that children are equipped with, skills and aspirations to reach their full potential in mind, body, heart and spirit.

## Intent

As a Church of England school, our Science curriculum is underpinned by our gospel values. These values are used and applied throughout the Science curriculum.

The children show curiosity about the world around them by asking and raising questions which they are then encouraged to seek the answers to, thus developing their scientific knowledge and understanding. They show attentiveness and active learning by taking on the role of a scientist by working scientifically whether it be through pattern seeking, carrying out research, identifying and classifying, observing overtime or through comparative and fair testing. Our children are learned and wise in the way that they apply scientific skills and knowledge in investigations and experiments and use these to raise follow up questions. They show gratefulness through the opportunities to go on trips and visits related to their science topics which paves way for experiencing science beyond the classroom walls, thus enhancing their learning and offering real life experiences. We are very lucky to have school dogs, chickens, a pond and a wide outdoor learning space including the woodland area and the fields. With animals all around, our children are able to develop and show their compassionate and loving side. At the heart of our Science curriculum is our knowledge and scientific enquiry, both evident in our curriculum learning journey. These knowledge and scientific skills are progressive and are built on year after year from EYFS all the way through to Year 6.

In Science, we want to instil a curiosity and a love of learning by getting the children to learn about the world around them through a combination of building up conceptual scientific knowledge, engaging in hands on activities and providing opportunities for learning to take place beyond the classroom walls. We believe that linking science to real-life experiences provide children with purposeful contexts and a deeper connection to their learning. Our curriculum aims to show the relevance of science to their everyday life; this allows them to learn more about the world around them. Our science curriculum promotes independence as well as working as a



team, inquisitiveness by working scientifically and high aspirations by increasing children's science capital.

Through our sustainability links, we want children to:

Understand the current issues around sustainability and climate change.

Identify that they have a role to play in creating a more sustainable future for themselves and others.

Think of ways to make a positive impact on their local and wider environments.

Have a positive and proactive mindset when it comes to making sustainable changes.

Our gospel values, core skills and key outcomes will raise aspirations and ensure that our children are more than ready for the next stages in their science journey.

### **Implementation**

St Giles' and St George's Science Learning Journey focuses on a spiral curriculum model where previous skills and knowledge are revisited and built upon. Over the course of the journey children will focus on both declarative and procedural knowledge. Declarative knowledge in science is the factual knowledge; this knowledge is not a list of disconnected facts; it is explicitly linked to the content being taught. Procedural knowledge can be viewed as the know-how to apply declarative facts - these are outlined in the working scientifically skills.

At St Giles' and St George's Academy, we use the White Rose Science scheme as a basis for our structure. Each year group has a series of 'blocks'. These blocks are then broken down into small steps. Each block has an enquiry question that it leads up to and each year group will cover the five types of enquiry over a year. Each 'small step' has a working scientifically skill focus. These skills are developed across year groups. Each year group has two blocks dedicated to sustainability.

In Science, work is recorded in an exercise book where appropriate, this may be in the form of writing, drawing or photographs, and marked in line with the marking policy.

Science is taught for an hour a week or two hours every two weeks depending on the topic and year group being taught. At the start of each unit of work, children **explore** what they already know about their topic and have an opportunity to recap previously learnt knowledge and skills. They have chance to raise any questions and think about what they want to learn during the unit. The learning intention is shared with the children at the start of the lesson and how they are working scientifically if appropriate. New knowledge and skills are specifically **taught** and modelled by the teacher and children have the opportunity to **practise** this knowledge. During the lesson activities are as active and hands on as possible, providing purposeful and engaging tasks that enable the children to **Apply** their new found knowledge and skills. These tasks are designed to have scaffolds and challenge where appropriate and assessment and feedback will focus on misconceptions and next steps for learning. At the end of each lesson, and then at the end of the topic, the children complete a **review** to show what they have learnt.

## Science Lesson and Learning Journey

### Lesson Journey



Explore - share LI, key vocabulary, prior learning, and explore the step (practical?)



Teach - teaching slides, teacher model of researching/ investigation,



Practise and questioning - mini scientific enquiry, questioning, children to have a go at researching,



Apply - answering questions independently, opportunity to apply disciplinary knowledge



Review - recap learning from the lesson, links to previous knowledge, contextualising what they have learnt

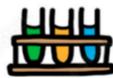
### Unit Journey



Explore - a mind map with the key question or topic in the middle. What do the children already know?



Lessons (T&P) - children will have a series of lessons around the topic that follow the 'Lesson Journey' structure



Apply - a lesson based on answering the key question and linked to the enquiry type



Review - review mind map adding what they now know

### **Reception/EYFS**

Science is taught as part of the Understanding of the World area of the EYFS learning and development. Children in Reception will explore a range of scientific skills and questions through their theme for the half term. Where appropriate, lessons will take the same form as the rest of the school: explore, teach, practise, apply and review. There will then be an independent activity relating to the input. All classrooms have an investigation station. As part of this, science based enhanced provision will be planned for. Children also have access to science based resources which they are free to use as part of the child-initiated provision. Evidence of these lessons and other learning around science can be found on Evidence Me linked to the appropriate statements and ELG.



## Reception Theme Subject Journey



### Explore

Children have the opportunity to explore the topic and subject area through tuff trays and child led learning. KWL grids and mind maps used to identify prior learning.

### Teach

Input and carpet sessions, in the moment teaching opportunities, concrete materials, teaching of new topic specific vocabulary.

### Practise

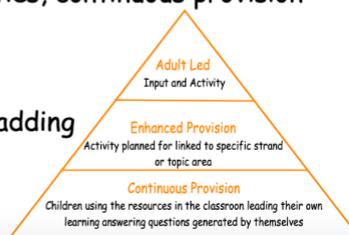
Group work, teacher guided sessions, tuff tray activities after input, key questions for children to explore and investigate on their own after being taught skills.

### Apply

Independent tasks, some enhanced provision opportunities, continuous provision opportunities, child-led learning

### Review

Mini input on previous learning, KWL revisit, mind map adding repeating 'explore' activities.



## Impact

In addition to the outcomes shown on our curriculum tree the specific impact of the St Giles' and St George's Science Learning Journey is that children will (as stated in the national curriculum):

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- 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

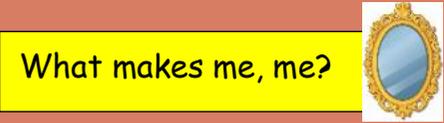
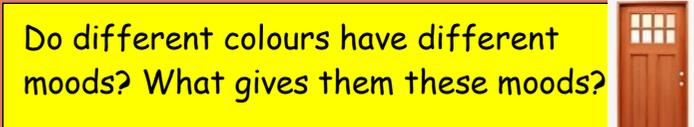
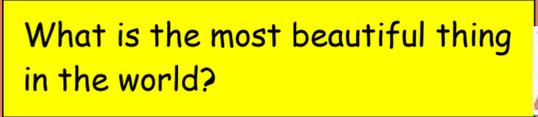
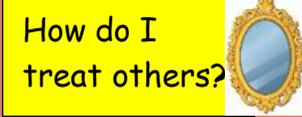
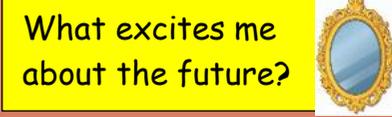
Formative assessment takes part in each lesson and misconception and next steps of the focus for feedback. Summative assessment is completed for each child at the end of each unit of teaching using the assessment framework at the end of this document. A best fit approach to statements achieved results in an end of year summative grade.

# Science Topic Overviews

## Reception

	Term 1	Term 2
Autumn term	<p>Marvellous Me</p> <p>What is important to me?</p> 	<p>There's no place like home</p> <p>What do you do in your time after school?</p> 
Spring term	<p>Once upon a time</p>	<p>Life on the farm</p> <p>What is the smallest thing there is?</p> 
Summer term	<p>A pirate's life for me</p>	<p>Commotion in the Ocean</p> <p>What is your favourite season?</p> 

# KS1 A

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	<b>The human body</b> 					<b>Seasonal changes (autumn)</b>	<b>Materials</b> 					<b>Seasonal changes (winter)</b>
Spring term	<b>Planting A</b>	<b>Animals</b> 				<b>Caring for the planet</b> 			<b>Seasonal changes (spring)</b>	<b>Planting B</b>	<b>Consolidation</b>	
Summer term	<b>Plants</b> 					<b>Planting C</b>	<b>Growing and cooking</b> 			<b>Seasonal changes (summer)</b>	<b>Consolidation</b>	

# KS1 B

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Autumn term	<b>Animal needs for survival</b>  Why do we care for plants and animals? 				<b>Humans</b>  What am I worth? 		<b>Materials</b> 					 <b>Plastic</b>	
Spring term	<b>Plants (light and dark)</b> Why do we care for plants and animals? 			<b>Living things and their habitats</b>  Why do we care for plants and animals? 								<b>Light and dark</b>	<b>Consolidation</b>
Summer term	<b>Plants (bulbs and seeds)</b>		<b>Growing up</b> If I try to succeed and fail, what have I learned? What am I scared of? 			<b>Bulbs and seeds</b>	<b>Growing up</b>	<b>Wildlife</b> 		<b>Consolidation</b>			

# LKS2 A

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	<b>Skeletons</b> What are feelings? Don't we deserve happiness? 			<b>Movement</b>	<b>Nutrition and diet</b> Why is there illness? 			<b>Food waste</b> 	<b>Rocks</b> 			<b>Consolidation</b>
Spring term	<b>Fossils</b> Is it good that scientists can't explain everything? 		<b>Soils</b> What is the purpose of Earth? 			<b>Light</b> How do we know we've found all the colours of the world? 					<b>Consolidation</b>	
Summer term	<b>Plants A</b>  What season most reflects your personality? 				<b>Forces</b>  Should we try to tame nature? 		<b>Magnets</b>		<b>Plants B</b>	<b>Biodiversity</b> 		

# LKS2 B

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Autumn term	<b>Group and classify living things</b> What responsibilities do I have for others? 			Data collection A	<b>States of matter</b> 								Consolidation
Spring term	<b>Sound</b>  What is the difference between hearing and listening? 				Data collection B	<b>Electricity</b>  Should we try to tame nature? 				Energy	Consolidation		
Summer term	Data collection C	<b>Habitats</b>  What responsibilities do I have for others? 		Deforestation	<b>The digestive system</b>					<b>Food chains</b>			

# UKS2 A

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Autumn term	<b>Forces</b>  What else is there to discover? 					<b>Space</b>  What lasts forever? 					<b>Global warming</b> 	<b>Consolidation</b>	
Spring term	<b>Properties of materials</b> 				<b>Animals including humans</b>  Can you love something that is ugly? 				<b>Life cycles</b>				
Summer term	<b>Reproduction A</b> Where does your identity come from? 		<b>Reversible and irreversible changes</b> What is unknowable? 			<b>Plastic pollution</b> 	<b>Reproduction B</b> Why isn't life always fair? 		<b>Consolidation</b>				

# UKS2 B

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	<b>Living things and their habitats</b> Should you respect yourself over all things? 					<b>Electricity</b>  How do we know what we don't know? 					<b>Renewable energy</b> 	
Spring term	<b>Light</b> What do you feel when you look at different types of art? 				<b>Light pollution</b> 		<b>The circulatory system</b>			<b>Diet, drugs and lifestyle</b> Is there such a thing as a bad person? 		
Summer term	<b>Variation</b>		<b>Adaptations</b> Are my beliefs important? 			<b>Fossils</b>  How do we know what we don't know? 		<b>Consolidation</b>		<b>Themed projects (Year 7 ready)</b> Is my understanding of self a selfish concept? 		

# Scientific Knowledge Progression

## Animals, including humans

KS1 A	KS1 B	LKS2 A	LKS2 B	UKS2 A	UKS2 B
<ul style="list-style-type: none"> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</li> <li>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</li> </ul>	<ul style="list-style-type: none"> <li>Notice that animals, including humans, have offspring which grow into adults</li> <li>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</li> </ul>	<ul style="list-style-type: none"> <li>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</li> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> </ul>	<ul style="list-style-type: none"> <li>Describe the simple functions of the basic parts of the digestive system in humans</li> <li>Identify the different types of teeth in humans and their simple functions</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey</li> </ul>	<ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age</li> </ul>	<ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>Describe the ways in which nutrients and water are transported within animals, including humans</li> </ul>
Autumn 1 Spring 2	Autumn 1, Autumn 2 Spring 2 Summer 2, Summer 4	Autumn 1, Autumn 2, Autumn 3	Summer 4, Summer 5	Spring 2	Summer 3, Summer 4

# Living things and their habitats

KS1 B	LKS2 B	UKS2 A	UKS2 B
<ul style="list-style-type: none"> <li>• Explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>• Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</li> <li>• Identify and name a variety of plants and animals in their habitats, including microhabitats</li> <li>• Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise that living things can be grouped in a variety of ways</li> <li>• explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>• Recognise that environments can change and that this can sometimes pose dangers to living things</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>• Describe the life process of reproduction in some plants and animals</li> </ul>	<ul style="list-style-type: none"> <li>• Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</li> <li>• Give reasons for classifying plants and animals based on specific characteristics</li> </ul>
<p>Spring 2 Summer 2, Summer 4</p>	<p>Autumn 1, Autumn 2 Spring 2 Summer 1, Summer 2</p>	<p>Spring 3 Summer 1, Summer 4</p>	<p>Autumn 1</p>

## KS1 A

Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees  
 Identify and describe the basic structure of a variety of common flowering plants, including trees

Spring 1, Spring 5  
 Summer 1, Summer 2

## KS1 B

- Observe and describe how seeds and bulbs grow into mature plants
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

Spring 1, Spring 3  
 Summer 1, Summer 3

## LKS2 A

- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant
- Investigate the way in which water is transported within plants
- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Summer 1, Summer 4

KS1 A	KS1 B	UKS2 A
<ul style="list-style-type: none"> <li>• Distinguish between an object and the material from which it is made</li> <li>• Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>• Describe the simple physical properties of a variety of everyday materials</li> <li>• Compare and group together a variety of everyday materials on the basis of their simple physical properties</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</li> </ul>	<ul style="list-style-type: none"> <li>• 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</li> <li>• know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>• use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>• Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>• Demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>• Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda</li> </ul>
Autumn 3	Autumn 3	Spring 1 Summer 2

## LKS2 A

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock
- Recognise that soils are made from rocks and organic matter

Autumn 5  
Spring 1, Spring 2

# States of matter

## LKS2 B

- Compare and group materials together, according to whether they are solids, liquids or gases
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Autumn 3

# Electricity

## LKS2 B

- Identify common appliances that run on electricity
- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- Recognise some common conductors and insulators, and associate metals with being good conductors

Spring 3

## UKS2 B

- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- Use recognised symbols when representing a simple circuit in a diagram

Autumn 2

# Earth and space

## UKS2 A

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

Autumn 2

# Seasonal changes

## KS1 A

- Observe changes across the 4 seasons
- Observe and describe weather associated with the seasons and how day length varies

Autumn 2, Autumn 4  
Spring 4  
Summer 4

## LKS2 B

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

Spring 1

# Light

## LKS2 A

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

Spring 3

## UKS2 B

- Recognise that light travels in straight lines
- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Spring 1

# Forces and magnets

## LKS2 A

- Compare how things move on different surfaces
- Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance
- Observe how magnets attract or repel each other and attract some materials and not others
- Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- Describe magnets as having 2 poles
- predict whether 2 magnets will attract or repel each other, depending on which poles are facing

Summer 2, Summer 3

## UKS2 A

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

Autumn 1

# Evolution and inheritance

## UKS2 B

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

Summer 1, Summer 2, Summer 3

# Disciplinary Knowledge (Working Scientifically) Progression

Working scientifically skills are split into eight key areas:

- Ask questions
- Plan
- Make observations
- Take measurements
- Gather, record and classify data
- Present findings
- Answer questions and make conclusions
- Evaluate (KS2 only)

	KS1	LKS2	UKS2
Ask Questions	Ask simple questions. Ask simple questions and recognise that they can be answered in different ways.	Ask questions and understand there are different enquiry types they could use to answer them. Ask relevant questions and use different types of scientific enquiry to answer them.	Ask scientific questions and begin to understand which questions would be best suited to each enquiry type. Ask relevant scientific questions and choose which enquiry type would be best suited to answer them.
Plan	Verbally state what they are going to investigate. Make simple predictions based on a question. Identify what they will change and keep the same	Make relevant predictions. Identify what they will change, observe and keep the same. With support, set up simple practical enquiries. Make predictions based on simple scientific knowledge. Identify what they will change, observe or measure and keep the same. • Set up simple practical enquiries, comparative and fair tests	Make predictions based on scientific knowledge. • With support, plan different types of scientific enquiry. Where appropriate, identify the dependent, independent and controlled variables. Make predictions based on scientific knowledge. • Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Make Observations	Observe closely, using simple equipment.	Begin to use scientific equipment to make observations. Make systematic and careful observations.	Use a range of scientific equipment to make systematic and careful observations with increased complexity.
Take Measurements	Carry out simple tests using non-standard measurements when appropriate. Perform simple tests using standard units where appropriate.	Carry out tests and simple experiments and take measurements using standard units. Take accurate measurements, using a range of equipment including thermometers and data loggers.	Take accurate measurements using a range of scientific equipment, with increasing accuracy and precision. Start to repeat readings when appropriate.
Gather, record and classify data	Gather and record simple data. Sort objects and living things into groups based on simple properties. Gather and record data to help in answering questions. Identifying and classifying.	Gather and record data in different ways to help answer questions. Recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables. Gather, record and classify data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	Gather, record and classify data with increasing complexity to help in answering questions. Record data using scientific diagrams and labels, classification keys, tables, bar and line graphs. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.

<p><b>Present Findings</b></p>	<p>Explain what they found out to an adult or a partner. Talk about what they have found out and how they found it out. (non-statutory)</p>	<p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p>	<p>Report and present findings from enquiries, Including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations</p>
<p><b>Answer Questions and make conclusions</b></p>	<p>Answer simple questions. Use their observations and ideas to suggest answers to questions</p>	<p>Make simple conclusions. Use results, findings or observations to answer questions. Use straight-forward scientific evidence to answer questions or to support their findings. • Use results to draw simple conclusions. Begin to identify differences, similarities or changes related to simple ideas or processes.</p>	<p>Use scientific evidence to answer questions. • Make conclusions based on scientific evidence and from their own testing and findings. Identify scientific evidence that has been used to support or refute ideas or Arguments Identify differences, similarities or changes related to simple ideas or processes</p>
<p><b>Evaluate</b></p>	<p></p>	<p>Suggest further investigations. Begin to make predictions for new values, suggest improvements and raise further questions.</p>	<p>Make new predictions for new values, suggest improvements and raise further questions. Use test results to make predictions to set up further comparative and fair tests. Suggest investigation improvements including accuracy of results. Provide some simple examples of how to extend the investigation.</p>

# Enquiry Type Coverage

**Enquiry questions** are highlighted when children are undertaking the scientific enquiry process. Each block has one enquiry question and there is coverage of the five enquiry types across a year. This allows children to develop answers to a range of relevant scientific questions. The **green** questions are where the question has a link to sustainability.



Enquiry Type	Reception	KS1 A	KS1 B	LKS2 A	LKS2 B	UKS2 A	UKS2 B
Research	Are all animals that live in the sea, fish?	How can we care for our planet?  Where does my food come from?  Does the oldest child have the longest feet?	How is plastic helpful and harmful for the planet?  What different habitats are there on planet Earth and what lives in each habitat?  Why is it important to care for wildlife?	What is a balanced diet and is it important?  What is food waste and how can we reduce it?  How are fossils formed?  What is biodiversity and how can we increase it?	How can we reduce our energy usage?  What impacts do humans have on different habitats?  What are the impacts of deforestation on the planet?  What is the digestive system and how does it work?  How has human activity affected food chains?	How have our ideas about the Solar System changed over time?  What is global warming and how can we help to reduce it?  How are the life cycles of animals similar and how are they different?  What is plastic pollution and what are the impacts of plastic pollution on planet Earth?	What is renewable energy and how can we use it to generate electricity?  What is light pollution and how can we reduce it?  What is the circulatory system and how does it work?  How have fossils changed over time and does this provide evidence for evolution?
Comparative /Fair Testing	Which material is the strongest for Little Red's basket?  Which material will keep me	Which material would be the best for a pair of curtains?	Which material would be the best for an umbrella?	Which soil absorbs the most water?  How does the distance	How does the distance from the sound affect the volume of the sound?	Which material is the best insulator of heat?	How does the voltage in a circuit affect the brightness of a bulb and the

	warmest in winter?		Do plants grow healthier in the light or dark?	between the light source and the object affect the size of a shadow?	How does the temperature of the water affect the time it takes for ice to melt?		loudness of a buzzer?  How does the distance from a light source affect the size of the shadow?  How does the duration of exercise affect heart rate?
<b>Observing over time</b>	How have I changed over time?  What changes occur to ginger bread men over time in different liquids?  What are the main changes in each season?	What are the main changes in each season?  How do the things I plant change over time?	How do bulbs and seeds change over time?	Does the number of seeds within one plant pot affect the growth of the plants?	What living things do we have in our local area and does this change over the year?	Which plant cutting produces the tallest plant?	How can we identify, group and classify plants, animals and microorganisms?
<b>Pattern Seeking</b>	Do bigger boats float better?	How can we sort plants into different groups?	Do the oldest children have the most teeth?  Are there patterns between the life cycles of	How does the material on the ramp affect the distance a car travels?  Are all metals magnetic?	What materials are conductors or insulators of electricity and is there a pattern?	Are there patterns linking gestation periods and lifespans?  Does the surface area of a parachute	Is the type of food a bird eats related to the shape of its beak?

			different animals?			affect how long it takes for it to fall to the ground?	
<b>Identifying, classifying and grouping</b>	How can we organise ourselves?  How can we sort farm animals?	Are all animals the same?	How can we group these animals based on their needs for survival?	How can we sort and group animals based on their skeletons?  How can we identify and sort rocks based on their properties?	How can we group and classify living things?	Which changes are reversible and which are irreversible?	How can we identify, group and classify plants, animals and microorganisms?

# Adaptive Teaching Strategies

Cognition and Learning	Communication and Interaction	SEMH	Physical and Sensory
<ul style="list-style-type: none"> <li>• Alternative methods of recording (talking tins, laptops, creative tasks)</li> <li>• Differentiated tasks</li> <li>• Visual supports</li> <li>• Word banks/phonic maps</li> <li>• Pre-teaching of vocabulary</li> <li>• Teaching of key skills</li> <li>• Coloured overlays</li> <li>• Timers and chunked activities</li> <li>• Use of practical apparatus</li> <li>• Sit close to the board</li> <li>• Allow extra time</li> </ul>	<ul style="list-style-type: none"> <li>• Talking tins</li> <li>• Pre-teaching language</li> <li>• Visuals to support</li> <li>• Now/Next</li> <li>• Increased focus on Oracy and developing talk opportunities</li> <li>• Thinking time</li> <li>• Explicit instructions</li> <li>• Makaton signs</li> <li>• Steps to success (one task at a time)</li> </ul>	<ul style="list-style-type: none"> <li>• Brain and movement breaks</li> <li>• Calm Brain</li> <li>• Reward time</li> <li>• Reflection areas (weighted blankets)</li> <li>• Sensory/fidget toys</li> <li>• Sit near to the teacher</li> <li>• Steps to success (one task at a time)</li> <li>• Peer buddies</li> </ul>	<ul style="list-style-type: none"> <li>• Own learning space (workstation)</li> <li>• Brain breaks</li> <li>• Appropriate seating</li> <li>• Fidget toys</li> <li>• Adapted resources (scissors, rulers etc.)</li> <li>• Sloping board</li> <li>• Alternative methods of recording</li> <li>• Wobble cushions</li> <li>• Use of a sensory areas (tent)</li> <li>• Chew buddies</li> <li>• Pencil grips/sloping boards</li> </ul>

# Assessment

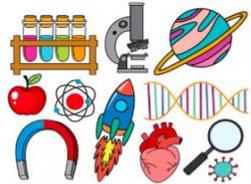
To keep track of children's individual progress, use the assessment grids below to support our teacher assessment.

In EYFS, children will be assessed against the Understanding of the World strand statements and Early Learning Goals at the end of the year. In our school, we assess children in Early Years as either: Emerging, Expected or Greater Depth in 0-3, Nursery or Reception.

For years 1 - 6, teachers will refer to the National Curriculum grids below to support their teacher assessment. They will highlight on a small assessment grid at the end of each science enquiry when completing the 'review' mind map. (see example grid below)

Year 1 End of Enquiry Assessment		
Enquiry Question: Are all animals the same?		
Enquiry Type: 		
	Scientific knowledge	Working Scientifically
Working Towards		
Working Within		
Greater Depth		

# 'Talk like a scientist' cards



## Talk like a Scientist!

1



### Notice Something

I have noticed...

I have observed...

### Make a Prediction

I think... because...

I predict... because...

Using what I know, I think...

### Gather the Data



I have already noticed...

What I am seeing so far is...



### Question it

I wonder why...?

I want to find out...

I wonder what would happen if...?

### Get Planning

The one thing I will change will be...

The things I will keep the same are...

We will be observing/measuring/comparing/pattern seeking/researching...

The best way to record this is...



### Draw a Conclusion

Looking at the results, I can see...

The results show that my prediction was correct/incorrect because...



# Talk like a Scientist!

2



## Notice Something

I have noticed...

I have observed...

## Make a Prediction

I predict... because...

Using what I know, I think...

My hypothesis is that... because...

## Gather the Data



I think there may be a connection between...

What I'm seeing so far is...

The pattern I am seeing is...



## Question it

I wonder why...?

I want to find out...

I think... if ...

We can test this by...

I want to investigate what would happen if...

## Get Planning

The variable I will change is...

The variables I will keep the same are...

We will be observing/measuring/comparing/pattern seeking/researching...

The best way to record this is...

## Draw a Conclusion



Looking at the results, I can see...

I think the odd result is because of...

The evidence supports/does not support my hypothesis because...

I can conclude that...