



# WREN'S NEST PRIMARY SCHOOL

School Key Policy for 2023-2024

## Science Curriculum Policy

September 2023

Document to be read in conjunction with ***other key school policies (listed within document)***

*"The important thing is to never stop questioning,"*  
Albert Einstein.  
**'We are Scientists'.**

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# Teaching of Science at Wren's Nest Primary School

## Aim

Science is a body of knowledge built up through questioning and experimental testing of ideas. Science is also methodology; a practical way of finding reliable answers to questions we may ask about the world around us. It is about developing pupils' ideas and ways of working that enable them to make sense of the world in which they live through investigation. Throughout the school, the children will be developing scientific skills that will lead to their work as scientists, planning and undertaking scientific investigations.

Through the teaching of Science, we would like to:

- ❖ Prepare our pupils for life in an increasingly scientific and technological world.
- ❖ Help our pupils to see the relevance of Science to the world around them, using practical experiences as often as possible.
- ❖ Build on our pupils' natural curiosity about the world around them.
- ❖ Develop a scientific approach to answering scientific questions.
- ❖ Provide our pupils with an enjoyable experience of Science, so that they will develop a deep and lasting interest and may be motivated to study Science further.

## Planning

At Wren's Nest we have developed the Medium Term Planning for each topic in Science for every year group (See Appendix A for example).

We continually develop our planning and reflect upon it, editing it according to what works best for our children. Each topic has a selection of tiered vocabulary which will be included in the lessons and displayed on the Science 'Working Wall'. The tiers are:

Tier 1: Simple every day vocabulary the children should be familiar with

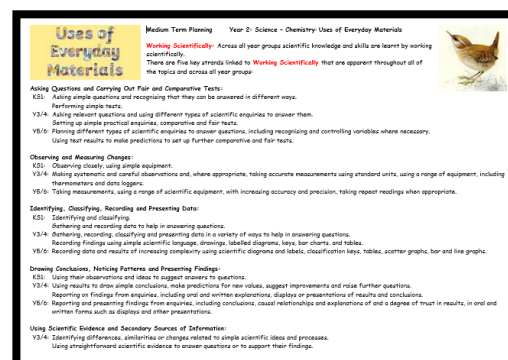
Tier 2: Scientific vocabulary the children are less familiar with

Tier 3: More sophisticated scientific vocabulary that is usually associated with a particular topic e.g. thermometer, rain gauge, comparison for Year 1 Seasonal Changes.

## Example

### Year 1: Seasonal Changes

Key Vocabulary			
Tier 1	Tier 2		Tier 3
Day	Observe	Daylight	Record
Hours	Measure	Year	Data
Night time	Autumn	Seasons	Scientific/scientifically
Month	Winter	Earth	Comparison
Weather	Spring	Event	Patterns
Clothing	Summer	Collect	Explanations
Outside	Gather	Movement	Monitor
Changes	Equipment		Investigate
	Day length		Thermometer
	Rain gauge		Weather Station/Symbol
	Wind direction		Observe
	Weather vane		Measure
	Temperature		Rain Gauge
	Thermometer		Weather Vane
	Rainfall		
	Weather symbol		



By having a selection of words from each tier added to the displays in the classroom, relevant to each lesson, the children's vocabulary will be continually developed and it also promotes inclusion for children of all abilities.

The Science Co-ordinator has worked closely with a Science Advisor/STEM Ambassador (N. Burfoot) from the University of Worcester in regards to developing the 'Working Scientifically' element of the Medium Term Planning.



## Whole School Topic Overview

A Whole School Topic Overview has been created to show the topics each year group will be teaching and during which term (see Appendix B). This shows the progression through the school and allows resources to be available when needed.

Wren's Nest Primary School Science Topic Overview							
Year		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFSP - Understanding of the World	Time for Twos	Seasonal Changes	Seasonal Changes	Seasonal Changes	Seasonal Changes	Seasonal Changes	Seasonal Changes
	Nursery	Seasonal Changes/Natural objects and world	Seasonal Changes/Natural objects and world	Seasonal Changes, Freezing and melting, signs of new life, exploring the natural world	Seasonal Changes, Freezing and melting, signs of new life, exploring the natural world	Life Cycles, Seasonal Changes, Freezing and melting, signs of new life, exploring the natural world	Life Cycles, Seasonal Changes, Freezing and melting, signs of new life, exploring the natural world
	Reception	Seasonal Changes/Natural objects and world	Seasonal Changes/Natural objects and world	Seasonal Changes, Freezing and melting, signs of new life, exploring the natural world	Seasonal Changes, Freezing and melting, signs of new life, exploring the natural world	Life Cycles, Seasonal Changes, Freezing and melting, signs of new life, exploring the natural world	Life Cycles, Seasonal Changes, Freezing and melting, signs of new life, exploring the natural world
	1	Animals including Humans, Seasonal Changes	Animals including Humans, Seasonal Changes	Uses of Everyday Materials, Seasonal Changes	Uses of Everyday Materials, Seasonal Changes	Plants, Seasonal Changes	Plants, Seasonal Changes
	2	Materials and their Properties	Materials and their Properties	Living Things and their Habitats	Plants	Animals including humans	Animals including humans
	3	Rocks and Soils	Rocks and Soils	Forces and Magnets	Plants	Animals including Humans	Light
4	Animals including humans	Animals including humans	Electricity	States of Matter	Sound	Living things and their habitats	
5	Earth and Space	Properties and changes of materials	Living things and their habitats	Animals including humans	Forces	Forces	
6	Evolution and Inheritance	Evolution and Inheritance	Living Things and their habitats	Animals including humans	Light	Electricity	

Science at Wren's Nest Primary School – 2019/20	
<b>Why?</b>	<ul style="list-style-type: none"> <li>Our vision in science is to encourage curiosity in children so that they ask questions that fuel explorations and investigations about the universe we live in.</li> <li>Science knowledge and understanding is important so that we understand and can question the world around us.</li> <li>Science can contribute to other areas of the curriculum, such as through topic, numeracy and literacy.</li> <li>By working scientifically our children develop the skills to question, enquire, evaluate and conclude in their research and experiments.</li> <li>Science contributes to a child's intellectual development by equipping them with knowledge of the world around them and skills in which to enquire.</li> <li>It is important to promote an enjoyment of science by encouraging the children at Wren's Nest to find the results of their experiments as interesting as possible, so they develop their investigative skills.</li> <li>To encourage our children to be ambitious for future career opportunities.</li> <li>To understand how science has changed lives to date and continues to. E.g. medication, waterproof clothing.</li> <li>Give opportunities and life chances in line with counterparts – many of our children don't have the opportunity to discuss scientific knowledge with adults – broken families, young parents with a lack of scientific knowledge.</li> <li>To counter balance the parental knowledge deficit to science – in many cases, science isn't a priority at home.</li> <li>Understanding how to lead a safe and healthy lifestyle – smoking, additions.</li> </ul>
<b>How?</b>	<ul style="list-style-type: none"> <li>Build on previous knowledge, encouraging and teaching to know more.</li> <li>Embed the children's scientific knowledge and skills by working scientifically across all year groups.</li> <li>Develop staff confidence in the teaching of science.</li> <li>Develop the children's confidence in science.</li> <li>Encourage children to ask questions by developing their skills of enquiry.</li> <li>Encourage children to ask simple questions and recognise that they can be answered in different ways.</li> <li>Children will be given the opportunity to make observations, use equipment and perform facts.</li> <li>Children will be able to use their observations and ideas to suggest answers to questions. Also, gather and record data to help in answering questions.</li> <li>Children will be encouraged to Work Scientifically through questioning. Scientific Enquiry – observing changes, finding patterns, grouping and classifying, fair testing, drawing conclusions based on data and observations, using evidence to justify ideas and using scientific knowledge to explain findings.</li> </ul>
<b>What?</b>	<ul style="list-style-type: none"> <li>Whole school science progression document to ensure lesson objectives and activities are relevant for that year group.</li> <li>Science leader monitoring – review of year group planning and assessments, book scrutinies and lesson drop ins to assess areas for support.</li> <li>Support given for science planning identified from monitoring.</li> <li>Opportunities taken for cross-curricular science.</li> <li>Informal staff discussions – will inform subject leader of any extra resources needed.</li> <li>Appropriate resources available in school to support scientific enquiry.</li> <li>Science Week to promote enjoyment of science, sharing activities as a whole school.</li> <li>Trips and visits to give first-hand experience and build on prior knowledge (e.g. Natural History Museum, Roberts Street Environmental Zone, <u>Spiddals</u>, Wren's Nest Nature Reserve, Jodrell Bank).</li> </ul>

## Curriculum Overview

The Curriculum Overview (see Appendix C) identifies 'why' we teach Science the way we do at Wren's Nest Primary School, 'how' we teach it and 'what' we do to monitor Science so that staff are supported and children have the experiences they need to become successful learners and scientists.

## Working Scientifically – Science Progression of Skills

Wren's Nest Primary School Science Progression of Skills							
SCIENCE Progression of Skills	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Observing and Measuring Changes</b>	<p>Discuss the similarities and differences. e.g. Do the leaves change on trees?</p> <p>Begin to observe closely, using senses and simple equipment. e.g. Are the leaves different in Spring?</p> <p>Use simple observations and ideas to suggest answers to questions.</p> <p>To observe simple changes over time and, with guidance, begin to notice</p>	<p><b>Observing closely, using simple equipment.</b> e.g. Through making simple observations, I can identify everyday materials and discuss their properties.</p> <p>Use observations and ideas to</p>	<p><b>Observing closely, using simple equipment.</b> e.g. Through making simple observations, I can identify everyday materials and discuss their properties.</p> <p>Use observations and ideas to</p>	<p>Begin to make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment. e.g. To know that magnetism is a force which can act without direct contact.</p> <p>Help to make decisions about what observations to make, how long to</p>	<p><b>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</b> e.g. To plan, set up and carry out comparative</p>	<p>Begin to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. e.g. To use scientific data to study early childhood growth and make comparisons between weight and height.</p>	<p><b>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.</b> e.g. To plan and develop a fair test that gives me information about the impact of exercise on my body (pulse rate).</p>

The Science Progression of Skills (see Appendix D) related to Working Scientifically has been created to demonstrate the specific scientific skills which the children will build upon each year. Although some areas of this document are not statutory in the National Curriculum, we have developed the skills and reflected on what elements the children would need to build upon before they can reach them. E.g. Using Scientific Evidence and Secondary Sources of Information is a skill required by the end of Key Stage 2, however, we have started to introduce these skills within EYFS and KS1.

## Topic Progression of Skills

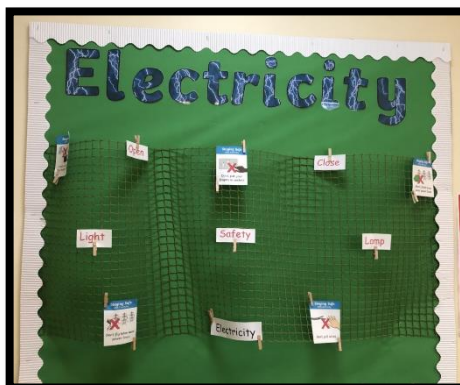
This document has been produced in response to the changes in the 2014 National Curriculum, it shows the progression through each topic throughout the year groups. This document ensures that the teaching and learning in Science is progressive; in line with the National Curriculum and enables teachers to ensure the experiments are not replicated. They are adapted and developed to follow the objectives and are age related.

Electricity-Year 4 and Year 6	
<p><b>YEAR 4</b> <b>Electricity: requirements to</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>identify common appliances that use electricity</li> <li>construct a simple series circuit, identifying and naming the basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>identify whether or not a lamp will light in a simple series circuit, based on whether or not the circuit is part of a complete loop with a battery</li> <li>recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>recognise some common conductors and insulators and associate metals with being good conductors</li> </ul>	<p><b>Notes and guidance (non-statutory)</b></p> <p>Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage. This will be introduced in Year 6.</p> <p>Pupils should be taught about precautions for working safely with electricity.</p> <p>Pupils might learn scientifically by observing patterns. For example, they might get together if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.</p> <p>Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage.</p>
<p><b>YEAR 6</b> <b>Electricity: requirements to</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>associate the brightness of a lamp or the volume of a buzzer with the number and type of cells used in the circuit</li> <li>compare and give reasons for variations in how components function, including the brightness of bulbs, the volume of buzzers and the on/off position of switches</li> <li>use recognised symbols when representing a simple circuit in a diagram</li> </ul>	<p><b>Notes and guidance (non-statutory)</b></p> <p>Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols.</p> <p>Pupils might learn scientifically by: de-phenetically identifying the effect of changing one component of a circuit in a circuit, designing and making a set of traffic lights, a burglar alarm or some other useful circuit.</p> <p>Note: Pupils are expected to learn only about series circuits, not parallel circuits.</p>



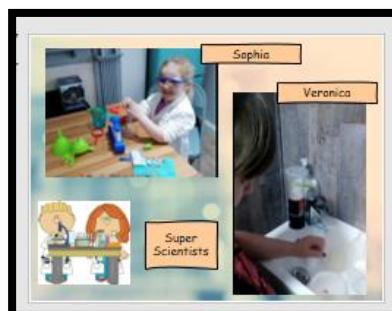
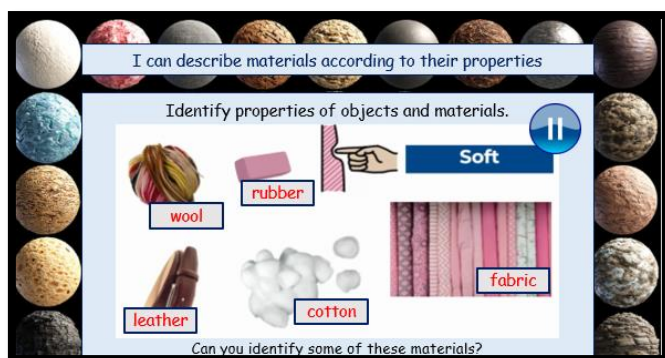
## Cross-Curricular Skills and Links

Science pervades every aspect of our lives and where relevant, we have related it to other areas of the curriculum. We will also ensure that pupils realise the positive contribution of various scientists. We will not only emphasise the positive effects of science on the world but also include problems, which some human activities can produce, e.g. global warming. Links are made to other curriculum areas including Literacy, Numeracy, Music et al. The school's Schemas of: Fashion, Food and Technology are also integrated into the children's lessons where applicable.



## Online Learning Opportunities

Science lessons, activities and experiments have, and will continue to be provided for the children on our school website. This includes lessons which are part of the Online Learning offer and videos showcasing the experiments the children have undertaken in school.



## Resources

We are continually developing our resources for science teaching. Resources are kept in a central store where there are clearly labelled boxes of equipment for each topic. Situated in the same store are collections of materials and objects of scientific interest, e.g. springs, gears, stones, shells etc. Topic related books are also available to support teaching. The school site is used as an educational resource offering a Nature Area and Planting Section with a greenhouse. Children are encouraged to choose from a range of equipment and are trained in the safe and considerate use of plants and consumable materials. Expensive and less frequently used items are also kept within the central store. Objects which are specific to a single year group may be kept within those class rooms (e.g. Space Resources are stored in Year 5). The Science coordinator is responsible for maintaining this area and ordering any necessary items that have been identified as a need (see Appendix G). All staff members have a shared responsibility for collecting and returning necessary items to the correct place to ensure that resources are easy for all staff to access. Perishable resources need to be ordered prior to teaching from the Science Leader. A small number of "vulnerable" resources are kept by the Science Coordinator. Educational visits and visitors are often linked to Science and include opportunities to study: the local environment, both urban and rural/animal and plant life in different habitats/exhibitions of scientific interest. Appropriate health and safety risk assessments are carried out.

## Displays and Vocabulary

At Wren's Nest every classroom has a Science Display showing the current topic being taught. On the display Tier 1, 2 and 3 vocabulary from the Medium term Planning is added throughout the topic to support the children's learning. This display is a 'Working Wall' and should include examples of the children's work and supportive information. It should be inviting and include physical objects so children develop their scientific enquiry. On each display throughout EYFS to Year 6 the mantra, 'We are Scientists' along with a visual representation of an actual magnifying glass promotes the children's understanding that they are 'Scientists'.



## Marking and Assessment

At Wren's Nest Primary School, because one of our school priorities is to raise standards in reading and writing across the curriculum, the detailed marking in History, Geography, Science and other curricular areas that involve the children writing, will be the same as for Literacy, unless it is inappropriate. For example, categorising activities in Science, where this would more likely require a tick and TA/TAP/TNA. In science, comments will be made against the subject related targets. However, comments should also refer to the children's writing skills when applicable (refer to the Whole School Marking Policy for further information). Assessment should be formative and used to inform the teacher of future planning, promote continuity and progression and be based on observation, participation and written/verbal outcomes.

## Health and Safety

All teaching staff are conversant with the school's 'Health and Safety' Policy and relevant regulations and plan accordingly. Teachers follow guidelines and take appropriate precautions. The safe use of equipment and consideration of others is promoted at all times. The "Be Safe!" publication by the Association for Science Education should be used by staff as a point of reference for issues regarding health and safety. A copy of this is held in the Science Co-ordinator's Room in the cupboard labelled, 'Whole School Science'. Teachers are encouraged to use this as an aid. Further details can be found in the 'Health & Safety' School Policy. Children should be made aware of safety issues and, where appropriate, the reasons behind them. Activities which take place away from the school's premises will require a separate risk assessment to be completed.

## Leadership and Management

The Science Co-ordinator and STEM Ambassador (M.Wyer) together with the Headteacher, Assistant Headteacher and the wider Senior Leadership Team are responsible for ensuring that the aims of the Science Policy are met. In addition to this, the science co-ordinator should:

- Be enthusiastic about science and demonstrate good practice.
- Encourage and support staff in the implementation of the curriculum and school approaches to Science teaching.
- Ensure progression and development throughout the school.
- Monitor the teaching and learning of Science throughout the school.
- Organise and review all science-based resources, ensuring they are readily available and maintained.
- Support staff by encouraging the sharing of ideas and organising CPD training as appropriate.
- Promote Science within school through the Association of Science, 'British Science Week' each academic year.
- Work with the school's Science Advisor and STEM Ambassador (N. Burfoot) from the University of Worcester to continue to develop our science curriculum.

## Science Vision and Principles Document

There is a clear vision for science that is well established and consistently implemented through principles for teaching and learning which are regularly reviewed by the whole school community. The Science Vision and Principles document has been created to make the purpose of Science at our school, explicit for all stakeholders. It reminds the staff and children what each Science lesson should be like.





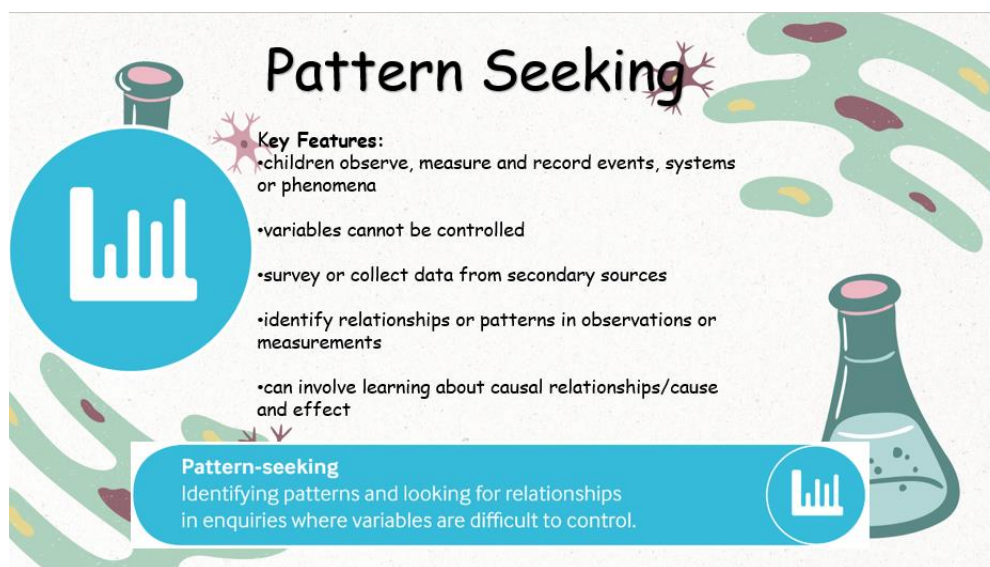
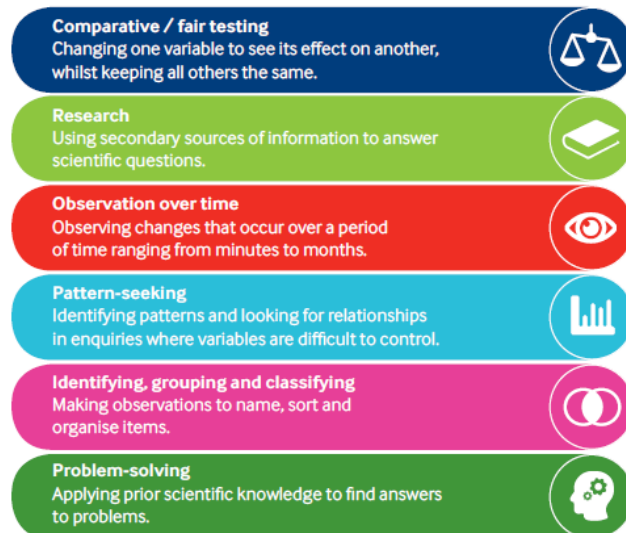
## Primary Science Quality Mark GILT Award

During the Summer Term 2022, we have been awarded the Primary Science Quality Mark GILT award. This is valid for three years, 2022-2025. This is a nationally recognised award for schools leading in the teaching and learning of Primary Science.



## Six Main Types of Enquiry

To develop science further since achieving the PSQM GILT Award in 2022-2023, we have developed a way of sharing the enquiry skills explicitly to the children and evidencing it through the targets in their books. We have embedded the Six Main Types of Enquiry through posters on each science display for the staff and children to refer to. We have edited the targets that go in the children's books to include the symbols, which relate to the main types of enquiry. These symbols were taken from the Primary Science Teaching Trust.



**Target**

**Success Criteria**

**Date**

Icons: Scales, Book, Eye, Bar chart, Binoculars, Head with gear, and three smiley faces.

Appendix A	Medium term Planning Year 1 Seasons
Appendix B	Whole School Science Topic Overview
Appendix C	Science Curriculum Overview
Appendix D	Working Scientifically - Progression of Skills
Appendix E	Science Topic Progression of Skills
Appendix F	Displays and Vocabulary
Appendix G	Resources Order Form