



## Science

### Statement of Intent

At St Giles Junior School, Science should be fully inclusive to every child. Our aims are to fulfil the requirements of the National Curriculum for Science; providing a broad, balanced and differentiated curriculum; ensuring the progressive development of knowledge, skills and vocabulary and for the children to develop a love of science. Furthermore, we aim to inspire in pupils a curiosity and fascination about the natural and man-made world and a respect for the environment that will remain with them for the rest of their lives. This includes the lessons they complete in the classroom, but also the other experiences they are offered, such as educational visits, residential and enrichment days.

The aims of teaching Science in our school are to:

- Equip children to use themselves as starting points for learning about science, and to build on their enthusiasm and natural sense of wonder about the world
- Develop through practical work the skills of observation, prediction, investigation, interpretation, communication, questioning and hypothesizing, and increased use of precise measurement skills and ICT
- Encourage and enable pupils to offer their own suggestions, and to be creative in their approach to science, devising their own investigations and taking lines of enquiry in a way that interests them
- Gain enjoyment from their scientific work
- Enable children to develop their skills of co-operation through working with others, and to encourage where possible, ways for children to explore science in forms which are relevant and meaningful to them
- Teach scientific enquiry through contexts taken from the National Curriculum for science
- Encourage children to collect relevant evidence and to question outcome and to build resilience to persevere as it is likely they will need to repeat results or will encounter unexpected results that do not support their hypothesis
- Encourage children to treat the living and non-living environment with respect and sensitivity
- Stress the need for personal and group safety by the correct usage and storage of resources
- To critically question the world around them

- To enable children to appreciate that we do not always know the answers when carrying out scientific enquiry as the world around them is continually changing and developing
- Equip children with the language to be able to discuss their learning and confidently explain their scientific understanding in small groups

### **Special Educational Needs Disability (SEND) / Pupil Premium / Higher Attainers**

All children will have Quality First Teaching. Any children with identified SEND or in receipt of pupil premium funding will be known to the class teacher and access to the curriculum will be adapted accordingly dependent upon their needs. As well as this, our school offers a demanding and varied curriculum, providing children with a range of opportunities in order for them to reach their full potential and consistently achieve highly from their starting points.

### **Implementation**

The Science subject leader is responsible for the curriculum design, delivery and impact in this subject. This includes meeting with Governors and SLT to review and quality assure the subject areas to ensure that it is being implemented well and coverage and breadth and balance is adequate. To ensure high standards of teaching and learning in Science, we implement a curriculum that is progressive throughout the whole school. Science is taught in discrete lessons for at least 2 hours per week in Key Stage Two. We ensure that teachers have the same expectations during Science lessons that they would have when teaching English or Mathematics and that any mathematical task (such as measuring or drawing graphs) is pitched at an age-appropriate level to ensure sufficient challenge. It is vital that any mathematical or English barriers should not impede a child's scientific learning, thus meaning dialogic learning is a central part to our Science teaching.

The Science curriculum at St Giles Junior School is based upon the 2014 Primary National Curriculum in England, which provides a broad framework and outlines the knowledge and skills taught in each Key Stage. Teachers plan lessons for their class using our progression of knowledge and skills document, which incorporates Working Scientifically.

## Long term curriculum plan

	<b>St. Giles Junior School Subject Long Term Plan</b>	
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Year Group	Autumn		Spring		Summer	
3 Science	<b>Plants</b> <i>(functions of parts, requirements for growth, water transport, flowers/pollination/seed dispersal)</i>	<b>Animals/Humans</b> <i>(nutrition, skeletal/muscular systems)</i>	<b>Space</b>	<b>Rocks</b> <i>(group/compare types, fossil formation, soil composition)</i>	<b>Light</b> <i>(sight, darkness, reflection, protection from sun, shadows)</i>	<b>Forces &amp; Magnets</b> <i>(movement /surfaces, magnetic forces, attraction/repulsion, compare sort magnetic, poles, predict)</i>
	<ul style="list-style-type: none"> <li>Celery investigation/observations</li> <li>Seed dispersal drama</li> <li>Investigation</li> <li>Changing variable re. plant growth</li> <li>Observational drawings (flower parts)</li> </ul>	<ul style="list-style-type: none"> <li>Maths: Reading/Comparing data</li> <li>Food diary</li> </ul>	<ul style="list-style-type: none"> <li>Space centre trip</li> <li>Researching historical figure (Neil Armstrong)</li> </ul>	<ul style="list-style-type: none"> <li>Writing opportunity: (Roger rock - stone to soil)</li> <li>Investigation – rock features</li> <li>Observational drawings</li> </ul>	<ul style="list-style-type: none"> <li>Investigation: Length of shadows</li> </ul>	<ul style="list-style-type: none"> <li>Investigation: Strength of magnets</li> <li>Investigation: Which materials are magnetic?</li> <li>Observations: magnetic force (repel/attract)</li> </ul>
	Christmas Performance					

### Y4/5

4/5 Science	<b>Materials</b> <i>(compare by properties, dissolving, separating mixtures, everyday uses by testing, reversible changes, irreversible changes)</i>	<b>Forces</b> <i>(gravity, air/water resistance, friction, magnets, mechanisms/pulleys/gears)</i>	<b>Living Things</b> <i>Animals/humans</i> <i>(grouping, classification/keys, changing environments)</i>	<b>Sound and Hearing</b> <i>(how made/vibration, sound travel, pitch, volume, distance)</i>
	<ul style="list-style-type: none"> <li>Investigation: Properties of materials – bouncing balls</li> <li>Conductor or insulator?</li> </ul>	<ul style="list-style-type: none"> <li>Investigation: Parachute size – air resistance</li> <li>Jamie Bond Friction</li> <li>Pulleys – How much weight?</li> <li>Water resistance (play dough shapes)</li> <li>Extended writing: Sir Isaac Newton biography</li> <li>How to make a pulley instruction</li> </ul>	<ul style="list-style-type: none"> <li>Extended Write – changing habitats</li> <li>Trip – Brandon Marsh (habitats and pond dipping)</li> </ul>	<ul style="list-style-type: none"> <li>Investigation – How sound waves travel</li> <li>Investigation – Sound proofing</li> </ul>

6 Science	<b>Light</b> <i>(light travels, seeing by reflection, light sources, shadows)</i>	<b>Electricity</b> <i>(voltage, comparing components/function, circuit symbols)</i>	<b>Living Things:</b> <i>(classification of plants and animals)</i>	<b>Evolution/Inheritance</b> <i>(fossils, offspring, adaptation)</i>	<b>Animals/Humans</b> <i>(circulatory system, impact of diet/drugs/lifestyle, transportation of nutrients/water in animals and humans)</i>
	<ul style="list-style-type: none"> <li>Crime Lab investigation – recognising light travels in straight lines</li> </ul>	<ul style="list-style-type: none"> <li>Electricity and D&amp;T link – design a machine to clean-up litter</li> <li><a href="https://www.stem.org.uk/elibrary/resource/35625">https://www.stem.org.uk/elibrary/resource/35625</a></li> </ul>	<ul style="list-style-type: none"> <li>Trip to <del>Two Cross</del> <del>Two Cross</del></li> <li>Moth Evolution Story – immersion day of learning including extended piece of writing</li> <li>Explanation text about the evolution</li> <li>Owl pellet science investigation</li> <li><del>Waffle</del> vs Liquorice investigation</li> </ul>	<ul style="list-style-type: none"> <li>Extended writing – Explanation text of How the heart works</li> <li>Investigation</li> <li>Dissection of the heart.</li> <li>Investigation: The art of being human – Gelatine/Egg</li> </ul>	<ul style="list-style-type: none"> <li>Investigation: <a href="https://www.stem.org.uk/resources/elibrary/resource/32036/air-survey-what-can-lichens-tell-us-about-air-quality">https://www.stem.org.uk/resources/elibrary/resource/32036/air-survey-what-can-lichens-tell-us-about-air-quality</a></li> </ul>
	<ul style="list-style-type: none"> <li>Topic Related work – sketching Tanks and Spitfires</li> <li>Cooking – carrot biscuits</li> </ul>	<ul style="list-style-type: none"> <li>Structure linked to WW2</li> <li>Electricity and D+T link – Design a machine to clean up litter</li> <li><a href="https://www.stem.org.uk/elibrary/resource/35625">https://www.stem.org.uk/elibrary/resource/35625</a></li> </ul>	<ul style="list-style-type: none"> <li>Colour mixing</li> <li>Shading</li> <li>Recreating half a Picasso</li> </ul>	<ul style="list-style-type: none"> <li>Felt phone cases</li> </ul>	

## Coverage of skills

The following grids include all of the skills that are taught in each year group and briefly what is covered. It shows the progression of these skills as students move up through year groups and how they build on the previous year's skills. Pupils are aware of these and evaluate these periodically with their teachers and sign them off in their Science books.

### *Science Progression of skills Y3*

*I can ask relevant questions and use different types of scientific enquiries to answer them*

*I can set up a simple practical enquiries, comparative investigation and talk about fair tests*

*I can make systematic and careful observations;  
I can take accurate measurements using standard and non-standard units of measurements*

*I can gather, record, classify and present data in a variety of ways*

*I can record my findings using simple scientific language, drawings, labelled diagrams, keys, bar charts or tables*

*I can reporting on my findings from enquiries:  
This could include oral and written explanations, displays or presentations of results and conclusions*

*I can use results to draw simple conclusions*

*I can identify differences, similarities or changes related to simple scientific ideas and processes*

*I can use straightforward scientific evidence to answer questions*

## Science Progression of skills Y4

I can ask relevant questions and use different types of scientific enquiries to answer them

I can set up simple practical enquiries, comparative and fair tests

I can make systematic and careful observations; take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

I can gather, record, classify and present data in a variety of ways to help in answering questions

I can record findings using scientific language or terms, drawings, labelled diagrams, keys, bar charts, and tables

I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions and start to make evaluations about what could be improved about investigations that have been run

I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

I can identify differences, similarities or changes related to simple scientific ideas and processes

I can use straightforward scientific evidence to answer questions or to support my findings.

## Science Progression of skills Y5

I can plan different types of scientific enquiries to answer questions, including recognising and changing variables where necessary

I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

I can use test results to make predictions to set up further comparative and fair tests

I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

I can identify scientific evidence that has been used to support or refute ideas or arguments.

## Science Progression of skills Y6

I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

I can use test results to make predictions to set up further comparative and fair tests and evaluate its effectiveness

I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

I can identify scientific evidence that has been used to support or refute ideas or arguments and add my own view point also

When teaching Science, teachers should follow the children's interests to ensure their learning is engaging, broad and balanced. Before planning a unit of work, teachers should assess children's prior knowledge and understanding to ensure work is pitched at the correct level. A variety of teaching approaches are used based on the teacher's judgement. Teaching key subject specific vocabulary is also a key part of our Science curriculum. The vocabulary children will need for that unit are identified on the school's progression document and this builds upon the vocabulary they have learnt in earlier years. The key vocabulary will also be identified in the vocabulary on the children's knowledge organisers and displayed in all classrooms.

Science assessment is based on teacher's assessment of children. At the end of a unit, teachers will identify if a child is working at the expected standard for that objective. This is then passed on to the next class teacher as a record of the child's progress throughout the year. Science work is moderated against the exemplification document published. Science provides excellent opportunities to enhance the learning of more able pupils through planning lines of enquiry, asking opened ended problems, analysing results and drawing conclusions based on scientific findings.

At St Giles Junior School, we provide a variety of opportunities for science learning inside and outside the classroom. Learning outside of the classroom, especially in our "Forest School" setting, is an essential part to learning science. It is essential children observe and immerse themselves in their local environment to apply their learning practically to real-life situations.

Every year, we have a "Science Week" or "Science Day" event, where the subject leader plans simple, engaging practical activities for the children to complete with their teachers and at home. This encourages them to ask questions about the world and demonstrates how they can think scientifically and investigate using simple everyday objects. This encourages families to engage with scientific activities themselves at home.

CPD will be offered to staff where needed, this may be a course to attend, an online CPD programme to take part in or the subject leader delivering training to the rest of the staff.

### Organisation, provision and time

Science is delivered within a whole school approach which includes:

- Dedicated curriculum time taught in accordance with the long term curriculum plan x 1 2 hour session per week
- Teaching Science as well as making links wherever possible through and in other subjects/curriculum areas
- The use of Science books to record work
- The use of Knowledge Organisers so children have access to key knowledge, language and meanings in order to understand and readily apply to their work in Science and across the wider curriculum
- Science Week/Day this includes a STEM focus
- Educational visits- where applicable links to Science will be made to develop the children's learning experiences

### Impact

Within Science at St Giles, we strive to create a supportive and collaborative ethos for learning by providing opportunities for children to question and investigate to discover answers for themselves and take their learning in a direction they are interested in.

Our Science curriculum is well thought out and is planned to demonstrate progression. We focus on progression of knowledge and skills and discreet vocabulary progression also form part of the units of work.

We measure the impact of our curriculum through the following methods:

- Children will achieve age related expectations in Science at the end of their cohort year
- Assessing children's understanding of topic linked vocabulary before and after the unit is taught
- Feedback of completed work
- Using dialogic learning tasks to assess children's understanding
- Summative assessment of pupil discussions about their learning
- Images and videos of the children's practical learning (uploaded to Seesaw)
- Interviewing the pupils about their learning (pupil voice)
- SLT/Moderation staff meetings where pupil's books are scrutinised and there is the opportunity for a dialogue between teachers to understand their class's work
- External moderation of children's work
- Annual reporting of standards across the curriculum to parents

The Science subject leader will continually monitor the impact science teaching is having on the children's learning through book scrutinies to ensure the progress of knowledge and skills is being taught. They will also ensure the knowledge taught is retained by the children and continually revisited and that the learners are able to apply the skills they have been taught to a variety of different settings, showing independence with their learning.

Subject Leader Miss S Veasey 2019-2020